ar

the functional tradition

Architectural review
v.122 1957

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1

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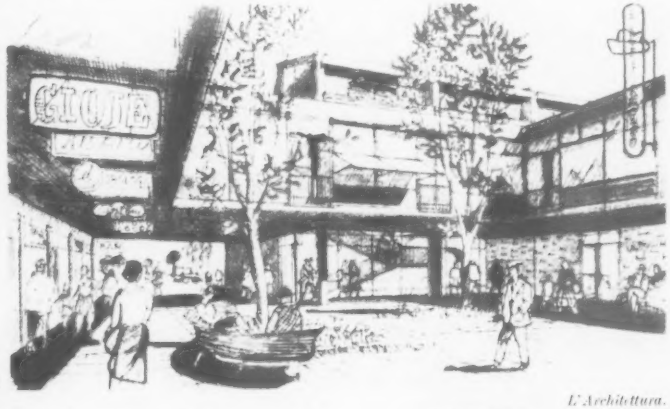
MARGINALIA

Italy and Townscape

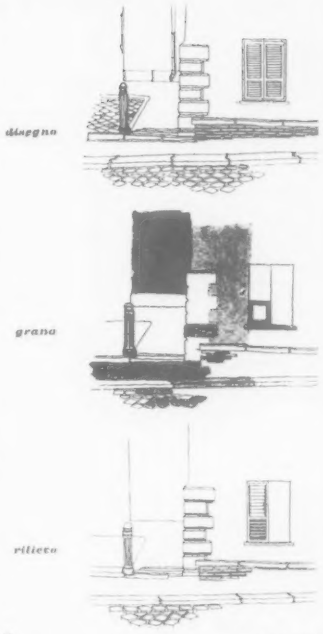
The post-war years have seen a rather pathetic procession of Italian town-planners and architects coming to Britain, bedazzled by our town-planning laws, and leaving again a few months later, baffled and bewildered by the discrepancy between legislation and fact. In the process, however, the live aspects of English town-planning thought have been noticed, in some cases understood, and have begun to filter back to Italy. There is something unmistakably English, for instance, about the winning design, 1, for a new covered market in Pescara, by Aymonino, Belardelli and Malatesta, exhibiting many of those townscape qualities that, ironically enough, have had to be illustrated in the REVIEW by examples from Italy's own past, but which no Italian publication has noticed until recently.

An example of the degree to which these are now being noticed is afforded by the most recent (No. 3) of the *Quaderni 'La Casa'* devoted to neighbourhood planning and its problems, edited by Ludovico Quaroni, who is internationally famous for his work at La Martella, (to be treated in the August issue). The book comprises an omnium-gatherum of essays on many aspects of neighbourhoods, historical, sociological, political and—how rare among recent literature—visual. In this last aspect it draws heavily on English examples and ideas. The reader finds himself confronted with the inevitable view of Finchingfield, the equally inevitable bibliographical references to Gibberd, Colvin, to the MARS group plan for London and to Harlow New Town. But much less inevitably he also finds examples of the Functional Tradition and Gordon Cullen drawings, and also Italy's own version of the townscape eye at work—still operating on a curiously split level, alternating between an abstract approach, which seems more concerned with qualities than things, or a humanity and feeling for character that could only have come from the country of *Ladri di Biciclette*. 3 is an example of the excessively abstract approach, analysing the scene as if it had no subject matter, no space, were simply a picture and nothing more; 2 is the kind of character study that every townscaper needs to be able to make, even if he lacks productive material like Trastevere to work upon.



1 *L'Architettura.*

2 *La Casa.*



3 *La Casa.*

Italy and Counter-Attack

The responses of leading Italian architectural magazines to the REVIEW's *Counter-Attack* programme have been revealing, as well as gratifyingly laudatory. *L'Architettura* (1957, No. 17) described the *Counter-Attack* issue as splendid, underlined the point about the need to differentiate between country and town, and underlined it again by reprinting the two sequences of sketches with which *Counter-Attack* demonstrated the rehabilitation of the urban and the rural scene. In its next issue, a correspondent signing himself L.B., and taking as his text the potted version of *Counter-Attack* that had appeared in *L'Espresso* (Rome) in February, turned it to polemical account as a stick to beat the *Razionalisti*, by drawing attention to a well-known plan for a new neighbourhood near Rotterdam, by Bakema, van den Broek and Tijen, and asking if this, 4, were not *Subtopia Razionalistica*—which, in view of the diagrammatic and space-wasting way in which each sub-neighbourhood is made indistinguishable from the next, is a very fair question.

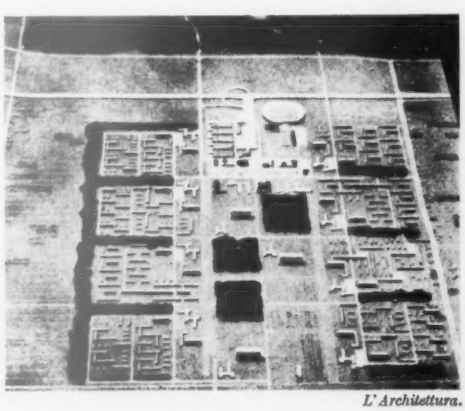
By contrast, A. T. Anselmi, in his bi-monthly review of periodicals in *Casabella* (No. 214) more or less accused the REVIEW itself of being too diagrammatic—'Singular is the contrast between a certain abstractness into which the general premises fall (particularly on account of excessive scrupulosity in classification by categories) and the effective concreteness of the detailed proposals.' But this seems to miss the point at issue. Town and country are not god-given categories, but man-made ones, and they are only meaningful as long as they are actively defined and socially operative and since they have been socially inoperative for so long in so many branches of human activity, it has become time to redefine them, and in a manner which recognizes that there are different characters of towns and of countrysides. The mere yes/no definition into Town and Country is already far more abstract than a finer distinction that recognizes such other categories as Metropolis, Arcadia and Wild as well.

Lodestone Protest

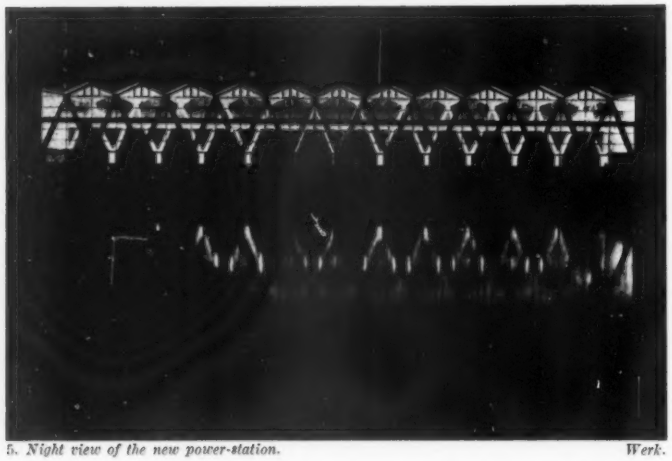
The spring, 1957, issue of the Birkbeck College magazine *Lodestone*, contains one of the first detailed protests to come from inside London University about the desecration being wrought by the University in Bloomsbury. Under the title of *The Illiterate Eye*, the anonymous author of this broadside makes the following points: that University building in Bloomsbury has been misguided as far back as the design of the Senate House; that what is most conspicuously misguided about this building programme is the demolition of Bloomsbury's unique townscape pattern of streets and squares, houses and trees; that irrespective of the effect of the scale of these new buildings on the townscape, they are second-rate, and too insignificantly genteel to attract even adverse comment; that in its architectural policy London University lags behind not only the more progressive universities abroad, but also most of the provincial universities at home. One can only hope that this last jab at London's parochial pride may combine with Sir Leslie Martin's recent appointment as planning consultant to the University to trigger a genuine change of eye.

Swiss Structure

An example of a convincing use of a somewhat assertive structural form in a location of acknowledged scenic interest is provided by the new power-station on the Rhine at Birsfelden near Basle. The four turbo-generators are housed in a glazed envelope with a ripple-pitched roof, supported on Y-legs that register with considerable visual emphasis, particularly at night, 5, (over-page), when reflections in the tailrace duplicate the effect. The successful integration of this dominant note into the revised riparian landscape is largely due to the unusual order of events in the programming of the overall design. The designer in charge, Dr. Hans Hofmann, had been working on the landscape aspects of the project since as early as 1942, and the decision to entrust the buildings to him as well was not taken until a decade later. Thus the design was considered in its wider aspects first, and the buildings were entrusted to



4 *L'Architettura.*



5. Night view of the new power-station. *Werk.*

an architect who had a ten-year acquaintance with the site and of its possibilities. It is to be hoped that this example will not be wasted on the projectors of atomic and other power-stations in our own landscape.

CORRESPONDENCE

Commonwealth Opportunity

To the Editors,

SIRS,—We admire and applaud your concentrated efforts to rescue the 'Old Country' from its subtopian development and wish you well in your mission.

Your fight no doubt will be long and bloody and a few sincere crusaders will find their energies and faith waning in the face of such odds. Therefore it is prudent to suggest that these saddened souls may wish to avail themselves of the opportunity to create their own 'Utopia' out here in this fair land of Australia. In the Commonwealth countries an architect can create his own environment, his sensitivity and aesthetic can formulate the pattern for a new life divorced from the mistakes of yesterday. What a golden opportunity exists for the idealist (and for those whose favourite role is forever 'the voice crying in the wilderness').

Let us shift our gaze to the potential of the Commonwealth countries, mobilize our energies towards the development of tomorrow, and a new beginning.

Attacks on subtopia may bear some importance but the Commonweath challenge is vital.

Yours, etc.,
JOHN DALTON.

Indooroopilly, Brisbane

Europe Rebuilt

To the Editors,

SIRS,—The article headed 'Europe Rebuilt' could have made a valuable departure from normal architectural journalism. The weakness is its failure to relate its topic to life. The buildings discussed are one reflection of chaos in the present world. The unsolved problems they represent are humanity's problems; here is a subject that reaches beyond technical and aesthetic discussion. In any case the situation is worse than the article admits; many people will agree that the examples cited are wholly bad, while overlooking the more widespread evil of a widespread lack of architectural vitality in buildings that are usually described as good.

History teaches us that the representative architecture of an era derives its characteristics from qualities of life and people. In a world of moral, political and social confusion it is surprising to hear an architectural critic explain the lack of unity in architectural expression as a failure to apply design principles; if only it were as simple as that.

The first requirement of architectural criticism is quasi-philosophical: to interpret the more general aspects of life that influence our art; leaving the particulars to be expressed in the work of those it helps to enlighten. The need expressed by post-war building is not for a book of rules about design, but for an increased awareness of our present human condition. In an era such as ours, of scientific complexity and spiritual desolation, people don't like seeing the world as it is. The normal reaction is to live as comfortably as possible with a limited but convenient philosophy that serves to mask the difficult questions. Thus, many architects are glad to accept without analysis or understanding a few efficient-sounding principles, and then consider that they are 'doing their bit' by helping to create a better environment. The results of evading the painful search for true values are available for all who wish to see; look through some recent magazines and see how few designs prove to be more than meagre architectural conceptions made interesting by the facility with which they adapt the current fashion; look at a typical student's final testimony and discover the deadly monotony of the 'Mies Technique' as used by designers lacking his insight and sensitivity; look at the fungus growth of overdone 'contemporary' interiors; diagnose the apparent need for over-dramatized 'isms'.

While this 'easy-way-out' game goes on, scientific development accelerates, and the task of adapting the bewildering possibilities becomes increasingly difficult. To face up to the world as it is, is to realise the need for means to cope with an unprecedented speed, scale and scope of change. Without the creative mind that can move abreast of science and speedily distil, in a climate of collective awareness and spiritual cohesion, the proper means of application and expression of a new technique, the battle for modern architecture will never be fought, let alone won.

The task is immense, and one looks in vain towards our architectural schools for some indication of a constructive approach to the real challenges of our time. Only the worst blind thinking could imagine that a system producing a large number of complete individuals, all qualified at the same low level, will meet the requirements. The successful practice of architecture now and in the future can only result from a close-knit design team; the carefully selected and organized group that can relate a real creative ability to the necessary breadth of scientific knowledge and a dedicated concern for human affairs.

It is interesting to note how problems as vital as life and death can quickly revolutionize the outlook of a profession as tradition-bound as soldiering; in war there is no option but to face up to realities. One might say it is unfortunate that well-designed buildings are not a prerequisite for human survival, but who knows, perhaps ultimately they are.

Yours, etc.,
REGINALD TREE.

Brighton.

Archer Abroad

To the Editors.

SIRS,—It is suspected but not proved, I believe, that Thomas Archer, groom-porter to Queen Anne and architect, may have visited Austria. All that is known is that he spent the years 1689–93 abroad.

By common consent, his tower at Birmingham (1709–15) stands apart from other such work in England; but I have long thought that it resembles work in Austria.

Unfortunately, the dates do not fit. The most similar Austrian tower, that of Dürnstein on the Danube, belongs to 1721–5; others of the same type are at Pausa (1714) and Zwettl (1723). The architects of Dürnstein are not known for certain. Munggenast was the builder; the designs are attributed to Prandtauer or Steindl. Prandtauer was born in 1660. Steindl was born as early as c. 1644. So towers of this type may well have been designed in or *en route* for Austria before Archer's visit, and, if so, can we adumbrate a link between Austria and Birmingham?

Yours, etc.,
EDMUND ESDAILE.

The Egyptian Revival

To the Editors,

SIRS,—Some of the readers of Dr. Pevsner and Dr. Lang's article on the Egyptian Revival may be interested in a hitherto unpublished watercolour in the collection of the Royal Institute of British Architects, (below). On the verso is inscribed 'Lord Digby's Park Gate W C.' The style of the drawing and the initials corroborate that this is from the hand of Sir William Chambers. It is the only example I can find of this architect using an Egyptian motif in such a context and on such a scale. The site of the gate must be Sherborne Castle, Dorset, and probably its Town entrance. It is not known whether the design was executed. A similar gate for the Duke of Richmond at Goodwood was engraved in 1759 for Chambers's Treatise on Civil Architecture. But in this instance the niches and Egyptian motif are missing. At about the same time Chambers was designing the eclectic buildings at Kew, and near to Sherborne he was building Duntish Court. It appears therefore that the design can be placed about the end of the 1750s, and neither later, when other architects were employed on the house and park, nor earlier, that is in 1756, when Capability Brown (whom Chambers disliked) was landscaping the grounds.

Yours, etc.,
JOHN HARRIS.

Intelligence

The South Park Street Cemetery Restoration Fund Committee, whose work in repairing the monuments in the Great Cemetery, Calcutta, is illustrated and described on pages 79–80, are still in need of another £1,000 in order to complete their work on this rare relic of Britain-in-Asia. For information about their appeal, and concerning their work, readers should write to the Secretary of the Committee, Wellesley House, 7 Wellesley Place, Calcutta I.

The Spanish firm of Cesar Ortiz-Echague, Manuel Barbero and Rafael de la Joya has won the first R. S. Reynolds Award, a $25,000 annual international prize given for the most significant contribution to the use of aluminium in architecture. The prizewinning building was a canteen at the S.E.A.T. car factory in Barcelona using aluminium as the main structural and roofing material.

Two international competitions are announced by the IUA: the first is for the development of the centre of Berlin, open to all architects living or born in Europe. The competition is anonymous and in one stage. The closing date is 30th November, 1957, and the first premium will be 30,000 DM; information obtainable from Senator für Bau und Wohnungswesen, Württembergischestrasse 6, Berlin-Wilmersdorf. The second is for a Solar House to be built in Arizona to encourage public interest in the use of solar energy. First premium 2,500 dollars; information from James M. Hunter, AIA, 1126 Spruce Street, Boulder, Colorado, U.S.A.

A year's interregnum in the direction of the school of Architecture and Design at Yale University has been ended by the appointment of Professor Gibson A. Danes, as the new Dean of the School, in succession to Professor Boyd Smith, and of Paul Rudolph as chairman of the Department of Architecture, thus permitting the acting Chairman, Professor Pfisterer to return to his work as Professor of architectural engineering.

ACKNOWLEDGMENTS

Except for those acknowledged below, all photographs in this issue were taken by Eric de Maré.

THE FUNCTIONAL TRADITION, pages 5–73: 8, 9, 17, 27, 116, 123, 166, 191–193, J. M. Richards, Arphot; 15, 18, 90, 94, 118, 119, John Piper; 19, 106, Marcus Whiffen; 22, McCallum, Arphot; 32, 37, 50, 52, Galwey, Arphot; 33, Dell & Wainwright; 36, 51, 53, 54, Herbert Felton; 103, M. H. Currer-Briggs; 183, Nairn, Arphot. MISCELLANY, pages 74–80: Functional Tradition, Past and Present: 1, NBR; 3, John Piper; 5, Galwey; 9, CEA. Exhibitions: 1, the Solomon R. Guggenheim Museum; 5, Marc Vaux; 6, the National Museum, Warsaw. Counter Attack: Bottisham, Andor Gomme; remainder, Nairn, Arphot. A Calcutta Cemetery: Bernard Matthews.

THE FUNCTIONAL TRADITION

AS SHOWN IN EARLY INDUSTRIAL BUILDINGS

edited by J. M. Richards *photographed by Eric de Maré*

This Month's Cover symbolizes the close connection between the nautical tradition of the shipwright and the functional tradition in architecture to which this issue is devoted. It is taken from part of an engraving in a Deptford scrapbook now in the British Museum, and shows the launching of H.M.S. Trafalgar in June, 1841, from a covered slip similar to those still surviving in the Royal Naval Dockyards at Chatham and Devonport (see pages 26, 30 and 33), now used as boat stores. The architectural arrangement of gun-ports along the side of the wooden ship is echoed in the windows set in the roof of the great wooden structure, itself framed in timber in shipwright's style.

1 **Marginalia**

2 **Correspondence**

4 **Frontispiece**

5 **The Functional Tradition** The word Functional is more closely associated with modern architecture than any other, and indicates the philosophical basis on which the movement rests. But in the heat of battle it has acquired the status of a revolutionary slogan, and the long tradition from which it derives has tended to be forgotten. Yet the functional tradition is as old as the styles, its history is threaded through theirs and the monuments of its development afford a view of the range and subtlety of aesthetic effects that can be produced by an architecture dominated by functional considerations. This special issue of THE ARCHITECTURAL REVIEW concentrates on one episode in that development, the last years of the eighteenth and first half of the nineteenth centuries, when the industrial revolution adorned many parts of Britain with bold, anonymously designed factories, warehouses, mills and the like. Although other types of buildings such as grain-mills and oast-houses are also discussed, the contributions of rural craftsmanship are not included, since they mostly fall outside the field of pioneer industrialization. Nevertheless, many traditions of anonymous functional design contributed to this remarkable phase of English architecture, and it is not for the pioneering of new materials alone that it commands our attention today. In new materials or old, with or without the influence of the architecture of the styles, it was a vernacular firmly grounded in the progressive spirit of the times, and it can provide valuable lessons for the architects of today, who stand in need of a similar vernacular, a means of answering the demands of functional discipline flexibly and unself-consciously.

8 **Warehouses** With their powerful rectangular outlines, gable ends, serried windows and usually massive construction, warehouses have already attracted attention as exemplars of the functional tradition, but the importance of their trim, paintwork and detailing deserves wider recognition.

18 **Docks** The forthright structural qualities of their concomitant sea-walls, gates and lighthouses are reflected in the more strictly architectural aspects of docks, the ranks of warehouses, the ancillary buildings, the thief-proof perimeter walls.

26 **Naval Dockyards** Built to house functions such as fitting-out and repairing of ships of the line, naval dockyards include types of buildings not found in commercial docks, and their official background gives them occasionally a more consciously architectural quality, though the underlying strength of their design still lies in the traditions of shipwrights and engineers.

34 **Textile Factories** Most early factory buildings were textile mills of one sort or another, and they were the buildings in which much of the pioneer-work in metal structure was done—though the ironwork was mostly internal and the exteriors in massive stone or brick retained a Georgian quality late into the nineteenth century.

48 **Water Mills** The classic industrial buildings of the rural landscape, watermills belong to a tradition of great antiquity, though most of the examples dealt with here are contemporaries of the early industrial buildings. Their common use of timber framing and cladding, however, sets them apart from textile mills in appearance.

58 **Windmills** A novelty in the twelfth century in England, the windmill achieved a style that was both elegant and robust by the time of its greatest utilization, when an estimated ten thousand were at work. Superseded at the peak of its development, the surviving examples show it at its most aesthetically satisfying.

62 **Breweries, Maltings and Oast-houses** One of the first activities to be organized on a factory basis, brewing and its tributary industries have contributed highly characteristic buildings to both the urban and rural scene. The processes involved are often complicated, must be organized in their proper sequence, and often require to be housed in structures of specific shape; breweries are thus frequently the most complex as well as the most satisfactory buildings in the functional tradition to be seen in small country towns.

Miscellany

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80 **The Industry**

A SPECIAL NUMBER OF

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THE ARCHITECTURAL REVIEW

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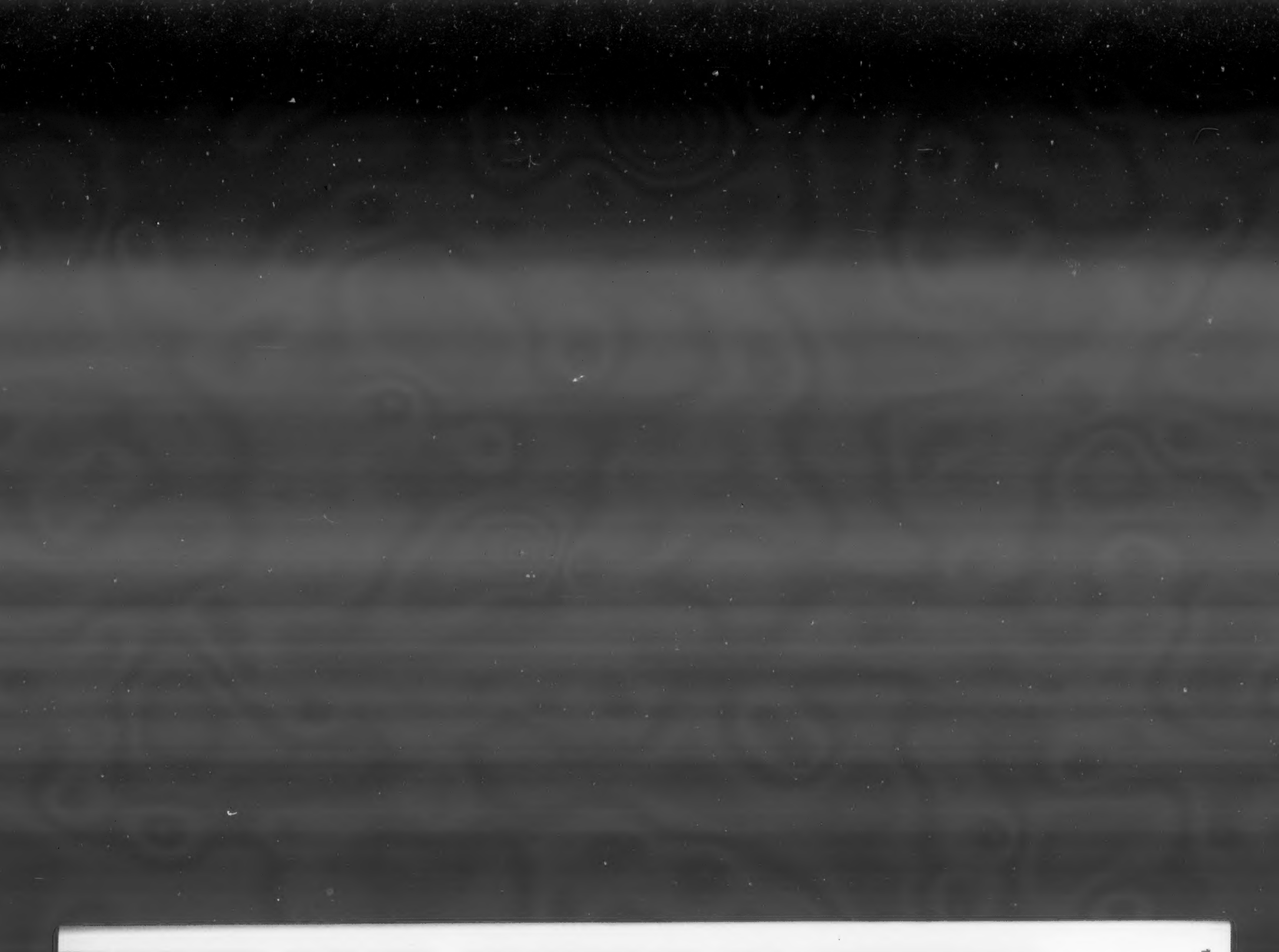
FIVE SHILLINGS

The theme of this issue is the functional tradition as shown in early industrial buildings, and the theme of the article opposite is that functionalism is not a creed peculiar to our time but the dominating ingredient of a deeply rooted tradition to which the anonymous architecture of every age bears witness. The qualities founded on functionalism come out as strongly in the buildings depicted on the following pages as they do in our own, and how much the two have in common is shown by the photograph above, 1: *part of the red brick and stone façade of Stanley Mill at Stonehouse, in the Stroud Valley, a woollen mill built in* 1813. *From the handling of forms and materials in buildings like this the modern architect has much to learn.*



THE FUNCTIONAL TRADITION

'Functional' is the word that has always been more closely associated with modern architecture than any other, both in the explanations of its apologists and in the popular mind; and rightly so, because even though its meaning has been continually distorted and misunderstood, it remains the basis on which the architectural philosophy of our time is founded. But because of all this misunderstanding, and the heat of the struggle to establish its supremacy over the literary and antiquarian philosophy of the nineteenth century, functionalism has acquired the reputation of being a revolutionary creed, peculiar to our day. The main purpose of this issue is to show how mistaken this is. The functional element has always been present in architecture, not only in the obvious sense that buildings have always had a function to fulfil, but in the sense in which we use the word now—of their aesthetic character being derived directly from the way in which the challenge of function is met.

There exists, in fact, a tradition of functionalism (hence the title of this issue), running parallel with the evolution of successive styles and weaving its way, as it were, in and out of them. Sometimes it is dominant and sometimes recessive, and to bring into focus another earlier episode in our architectural history when the functional values that we look up to now were dominant, as the following pages are designed to do, may serve to put our own age into its proper perspective (and thus to allay the feeling that there is anything alarming or subversive in our preoccupation with functionalism) and at the same time, perhaps, furnish some useful lessons about the range and subtlety of the aesthetic effects of which an architecture dominated by functionalism is capable.

The episode in history chosen for this purpose is that which produced the great numbers of largely anonymous mills, warehouses and factories that rose up so boldly—and, as it must have seemed at the time, brutally—in the last years of the eighteenth century and the first half of the nineteenth, the years when England was being transformed by the

industrial revolution of which they were of course the product. But they were not confined to the regions now given over to industry. They stand along the canals and railways, inhabit remote valleys whose water-power brought them temporarily within the grasp of industrial improvement, rise squarely above the water's edge in docks and harbours from one end of the country to the other.

They have remarkable architectural qualities: sometimes a breath-taking scale and power, sometimes a gentler assurance in the handling of materials and the treatment of the various architectural elements like stairways and window openings, which should gain for them, frankly utilitarian though they are, far more admiration than they have previously been accorded. Indeed to many Eric de Maré's photographs will be a revelation, and we may wonder why so little attention has hitherto been paid to the buildings they depict.

The explanation, one must suppose, lies partly in the automatic operation of the cycle of taste—we are only now becoming capable of looking dispassionately at the nineteenth century—and partly in the very process, already referred to, by which the functional element in architecture becomes dominant for a time and then for a time relapses into the background. For we respond most readily to buildings possessing the qualities our own aspire to; and we are now ready, as we were not a generation ago, to admire the functional tradition whenever we find evidence of it in the architecture of the past.

Appreciation in our day of the anonymous mills and warehouses of the industrial revolution thus logically follows our discovery a few years ago of the beauties of the engineering structures that not only accompanied that revolution but gave it its impetus. Those who led the fight in the nineteen-thirties to free architecture from the straight-jacket in which the academies had confined it for a hundred years, concerned as they were with gaining freedom to make the most of all the newly discovered techniques and materials, drew much encouragement from the pioneer efforts of the engineers and praised their works accordingly: the bridges and aqueducts, the train-sheds and harbour-works of men like Telford, Stephenson and the two Brunels—which so inspiringly exploited the discoveries of science at the same time as the architects were turning their backs on science and increasingly concerning themselves with the niceties of scholarship and fluctuating stylistic fashions.

A few years ago, that is to say, we were interested in the technical initiative shown in the engineering products of the industrial revolution; now the time is ripe for us to move on to learn what we can from the industrial architecture, which, as distinct from the engineering, was not for the most part preoccupied with experimenting with the new materials. Textile mills at Shrewsbury and Derby did pioneer the iron frame, and other mills and warehouses used iron in different and sometimes unprecedented ways; but most of these early industrial buildings were of solid, orthodox brick, stone or timber construction. Their lesson for us is their subtle and infinitely varied use of an unselfconscious idiom derived from meeting the challenge of the building's function fairly and squarely.

The vigorous and forthright qualities shared by all the artifacts of the industrial revolution—engineering structures and industrial buildings alike—is not surprising when we consider that they express the enterprising spirit that was stirring so deeply in their time. Periods of war and civil strife leave to posterity their castles. Periods dominated by the power of religion leave their abbeys and cathedrals. And periods when a nation's energies are concentrated on commerce and industry leave factories, warehouses, docks

and suchlike buildings which, if they have had as much creative energy focused on them as English buildings of this kind had in the years following the industrial revolution, possess something of the same vigour and conviction as the castles and cathedrals.

That is the simple origin of the remarkable quality of the buildings to which this issue is devoted, but they draw added strength from belonging to the functional tradition. Indeed some of them belong more strictly to the deeply rooted aspect of that tradition than to the new contribution that was made to it during the industrial revolution. For example the brick and timber water-mills, seen at their best in East Anglia and the Home Counties, to which one section of this issue is devoted. Although these mostly date from the time of the industrial revolution, they reach further back into a rural tradition of building which, like the nautical tradition, has answered practical needs with an instinctive rightness and economy for as long as building has existed.

Many other traditions, of course, merge with the functional, so that the buildings illustrated here are the end product of a long anonymous process to which the builder in search of an economical structure and the manufacturer in search of convenient accommodation together contributed, but into which also entered the years of experience of generations of millwrights and other craftsmen, the tradition of those who furnished the countryside over centuries with its plain rectilinear barns and farm buildings, and the newer traditions of the simple, functionally designed stables and other appendages that often provide a foil to the more sophisticated architecture of country houses. These builders carried with them into the nineteenth century some of the Georgian instinct for proportion and rhythm, and sometimes the habit, learnt from the Georgian architects, of ornamenting a doorway or a stairturret with reminiscences of classical detail.

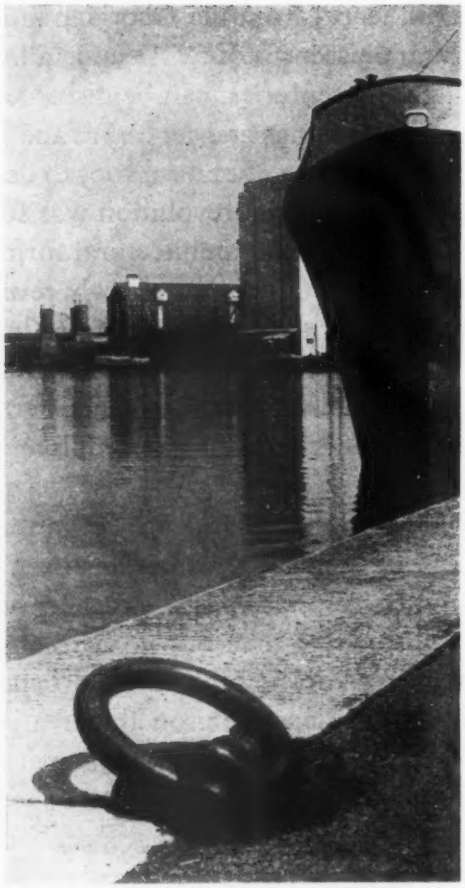
The functional tradition, as we trace it through the centuries, can be discerned in all sorts of objects besides the strictly architectural, like railings and fences, as the REVIEW has already pointed out. The REVIEW has already paid some attention, too, to design on the canals and railways, on whose development the industrial revolution was founded. In the buildings shown here it comes out in its most powerful architectural form. The best of them, newly revealed to us just as the beauties of Gothic were newly revealed to the eighteenth-century antiquarians, add another chapter to the volume of fine buildings that the architecturally minded visitor comes to England to admire : her cathedrals, her castles (which represent another episode when functionalism was dominant), her market towns, her country houses, her urban squares and terraces—and now her mills and docks and warehouses.

But to the modern architect they have a significance that goes deeper even than this. He has reached a crucial point in the development of his art, which has been utterly changed by new technical resources, new planning responsibilities and new aesthetic ideals. Its impetus, that is to say, has been a revolutionary one, but no art can remain for ever in a state of revolution. Innovation gives it its vitality and its capacity to develop, but after the revolution comes consolidation, depending on the creation of a vernacular language in which the ideas of the innovators gradually become merged.

Architecture's special need now is to perfect such a vernacular, even in the face of the difficulty that it means achieving the unselfconscious virtues in an age peculiar for its self-consciousness. How can this better be done than by striving to carry on the functional tradition which inspired the anonymous vernacular of these early industrial buildings? In them we see a preoccupation with functionalism similar to our own, with the disciplines functionalism imposes transformed into a flexible architectural language.

WAREHOUSES

The function of a warehouse needs no description. It is a building for storing goods, most often goods in transit, since the warehouses of the early nineteenth century, chiefly represented here, were built in the greatest number along the waterways (as they were later along the railways) on which the expanding commerce of those days was founded. They are essentially utility buildings, in which expenditure is concentrated on such necessities as strength, wide uninterrupted floorspaces (hence the great advance made when iron roof-trusses were introduced), easy handling of goods and the protection of the fabric of the building against the rough treatment that dealing with heavy goods often involves (hence the hard materials used for plinths and door-jambs and the granite bollards leaning against corners).

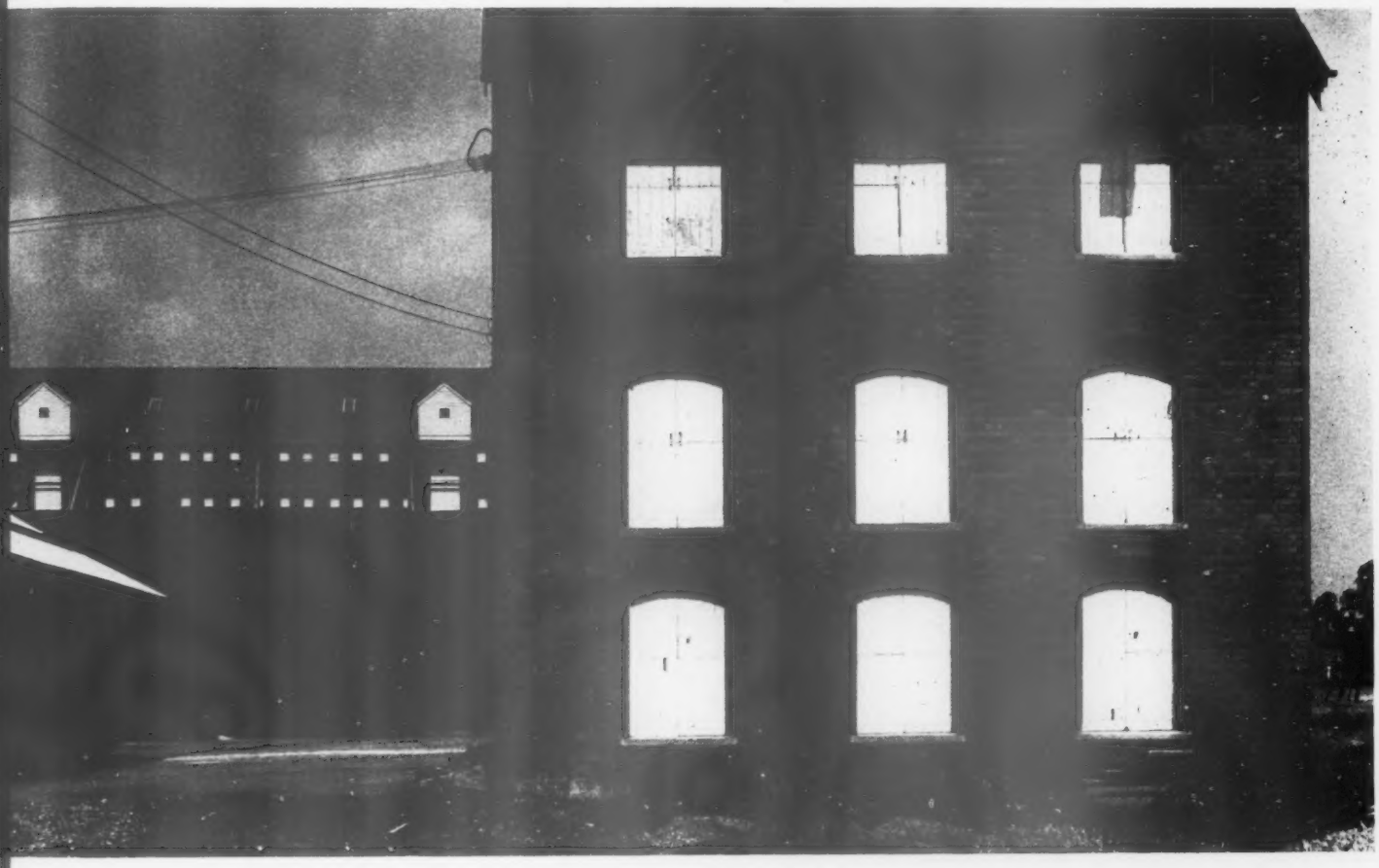


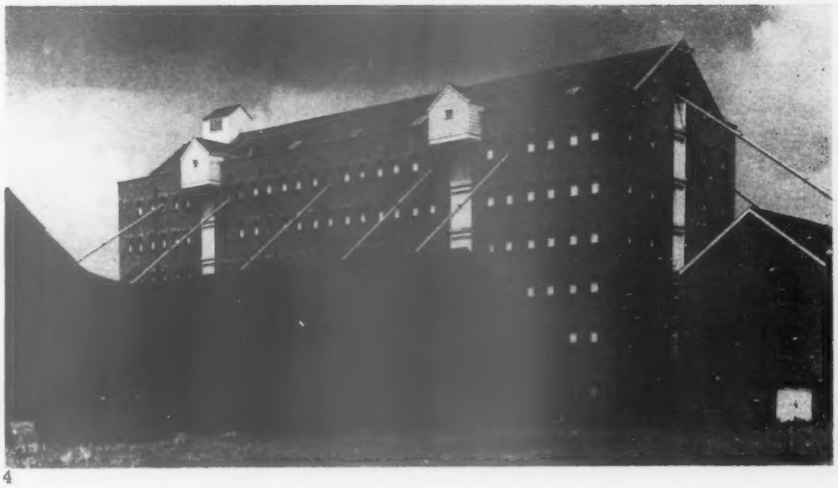
2, the warehouse in its setting: Sharpness, Glos., where the ship-canal terminates (see facing page) and where the functional tradition is illustrated by nineteenth and twentieth century warehouses standing side by side.

The great warehouses that form an integral part of the London, Liverpool and other docks are represented separately in the next section. This section illustrates, for the most part, isolated warehouse buildings, some serving the smaller shipping basins, river quays and canal-side wharves; others (like the tall bonded warehouses in the City of London) serving a big commercial centre's entrepot trade, while others served some country-town activity such as flour-milling.*

But whether they are an actual product of the industrial revolution like the former, or link up like the latter with earlier handicraft traditions, they share the same architectural characteristics: powerful rectangular outlines; gable ends often supporting cranes and hoists; tiers of superimposed doors for loading and unloading; rows of squarish windows, deep-set and usually with segmented arched heads. Materials are local stone and brick, used functionally and traditionally. Few warehouses—perhaps because of the risk of fire—are built wholly of wood, but tone and colour contrasts between the walls and the painted woodwork of heavily battened doors contribute much of their robust but lively quality; so do areas of whitewash and bold painted lettering. Iron when used for construction is not seen, but it appears in the form of windows and window-bars and the very characteristic heavily moulded tie-irons.

* Those at Wisbech, a particularly fine range, have already been illustrated in the REVIEW, in December, 1939.





4

In these towering red brick warehouses at Sharpness, the characteristic rhythm of windows interrupted by tiers of loading-doors is emphasized by the light contrasting paintwork of the wooden shutters that fill each window aperture. Sharpness is at one end of the Gloucester and Sharpness ship canal, linking the Bristol Channel to the Severn (see page 23 for photographs of the docks at Gloucester, at the other end). The canal is 16 miles long. Telford was its engineer. It was opened in 1827 and Sharpness was enlarged in 1874 when it became a miniature 'company town' with its own housing. These buildings therefore date from the 1870s.

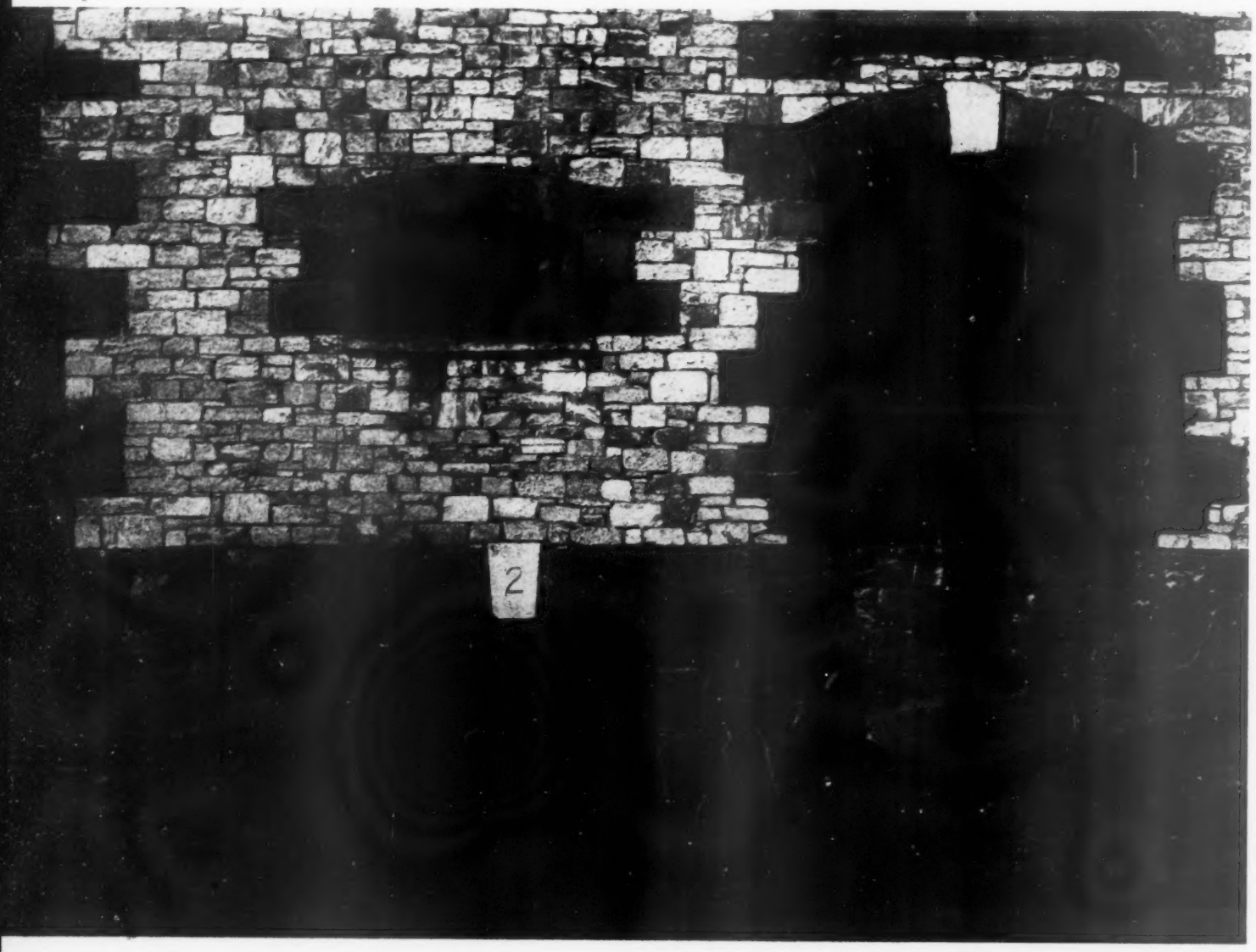
5

A type of nineteenth century warehouse frequently met along the canals of the industrial areas has an archway through the centre which serves as a loading-dock. 5, now derelict, is at Macclesfield.

6

The riverside or estuary-side warehouse has, as a rule, a softer and less dogmatic character than the canal-side warehouse of the industrial revolution, but it is no less dependent on functionalism. These examples at Exe Quay, Exeter (dated 1835), also show—see close-up, 7, below—that richness of texture is not incompatible with the functional tradition.

7



WAREHOUSES

8

9

Another group of riverside warehouses, on the Witham at Boston, which was a thriving port until the river became too silted up for large vessels in the eighteenth century. 8, the river side; 9, the landward side showing the white paint and bold lettering which often enliven these flat brick frontages.

11

12

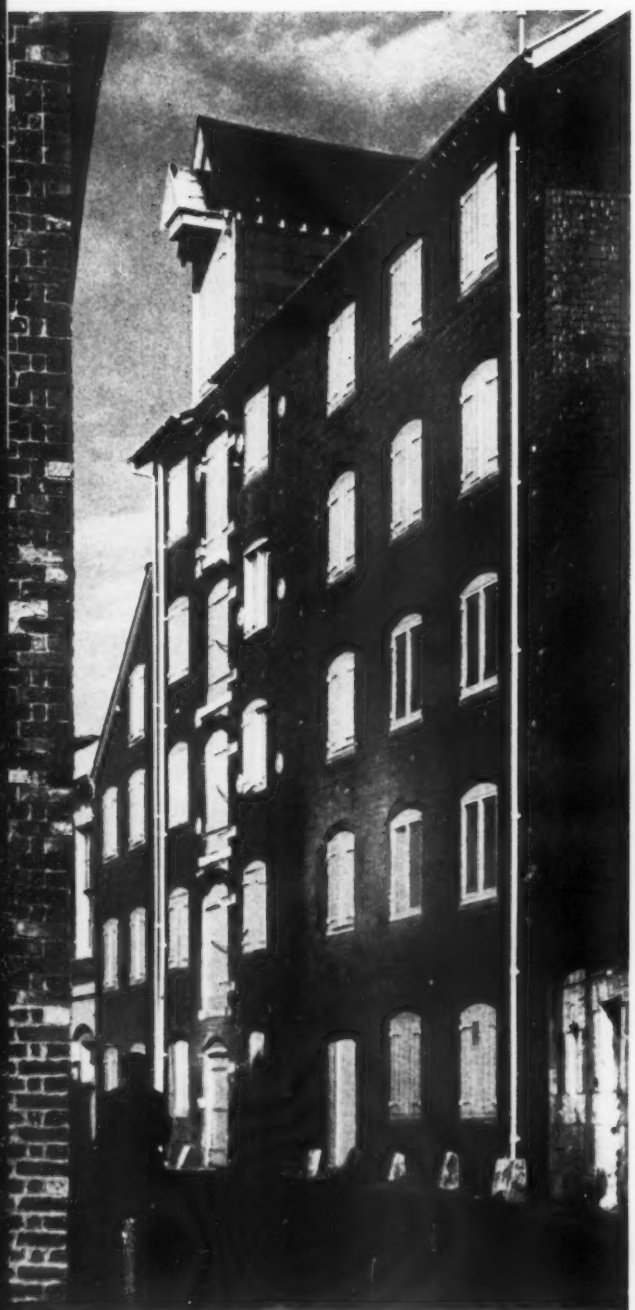
10, 11 and 12, warehouses at Gainsborough, Lincs, backing on to the River Trent, typical of the gabled brick grain warehouses of East Anglia. Again sparkle is given to them by contrasting white paintwork.

10

15, a stone built example on the quay at Looe, Cornwall; small, but monumental in scale, using a mixture of smooth grey stone and brownish rubble.

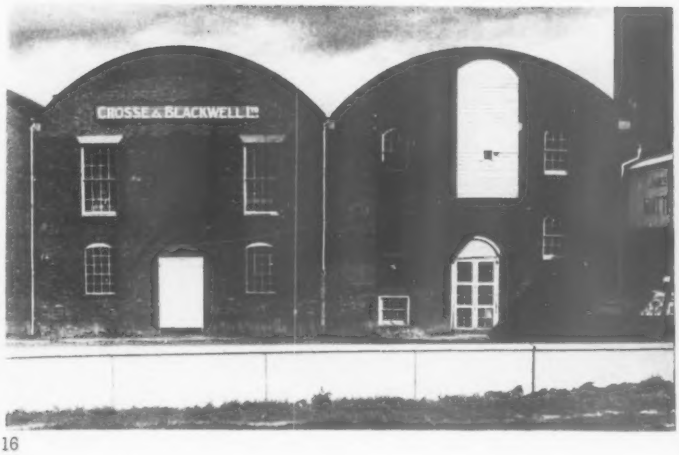
WAREHOUSES

15



13 Red brick warehouse on the old quay at Poole harbour, Dorset, belonging to Oakley Bros., corn, cake, seed and fertilizer merchants. The paintwork is the traditional light buff, and the wall surface, as often happens, floured over with white. The detail alongside, 14, shows the sturdy proportions of the doorway and the subtleties of texture produced by the wearing of the brick and timber surfaces.

14



16

17

Variety in character and outline: 16, at Hythe Quay, Colchester—note the differently shaped doors and windows which do not affect the strong rhythm of the sequence of arched roofs; 17, at Boston, where the strong horizontal eaves-line, the round arched windows and the enriched central doorway give the building a formality appropriate to its use as a customs warehouse.

18

18, a vigorous example of unusual personality, also at Boston (on the opposite side of the river from the group of warehouses shown in 8 and 9; the top of Boston Stump can be seen on the left). The wide-eaved, low-pitched roof, the plaster wall surface, quoins and round-arched basement windows, all give the building a surprisingly foreign air. It is a prominent and distinguished feature of the town as one enters it from the west, but its elegance has been spoilt since this picture was taken by advertisements plastered over it.

19

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22

Timber boarding, tarred or painted over a brick base, is much used, especially in the Home Counties and East Anglia, for the smaller kind of shed or warehouse: 19 and 20, at Ware, Herts., and Halstead, Essex. The latter, now used as a carpenter's workshop, has the long window, subdivided vertically, often found in timber-framed buildings of this kind. Warehouses on an industrial scale are rarely of timber because of the risk of fire, but 21 is an example from Boston. 22 is a reminder of the charming qualities of that much maligned material corrugated iron. It sheathes this warehouse on the waterside at Woodbridge, Suffolk, which may once have been a boarded water-mill.

23

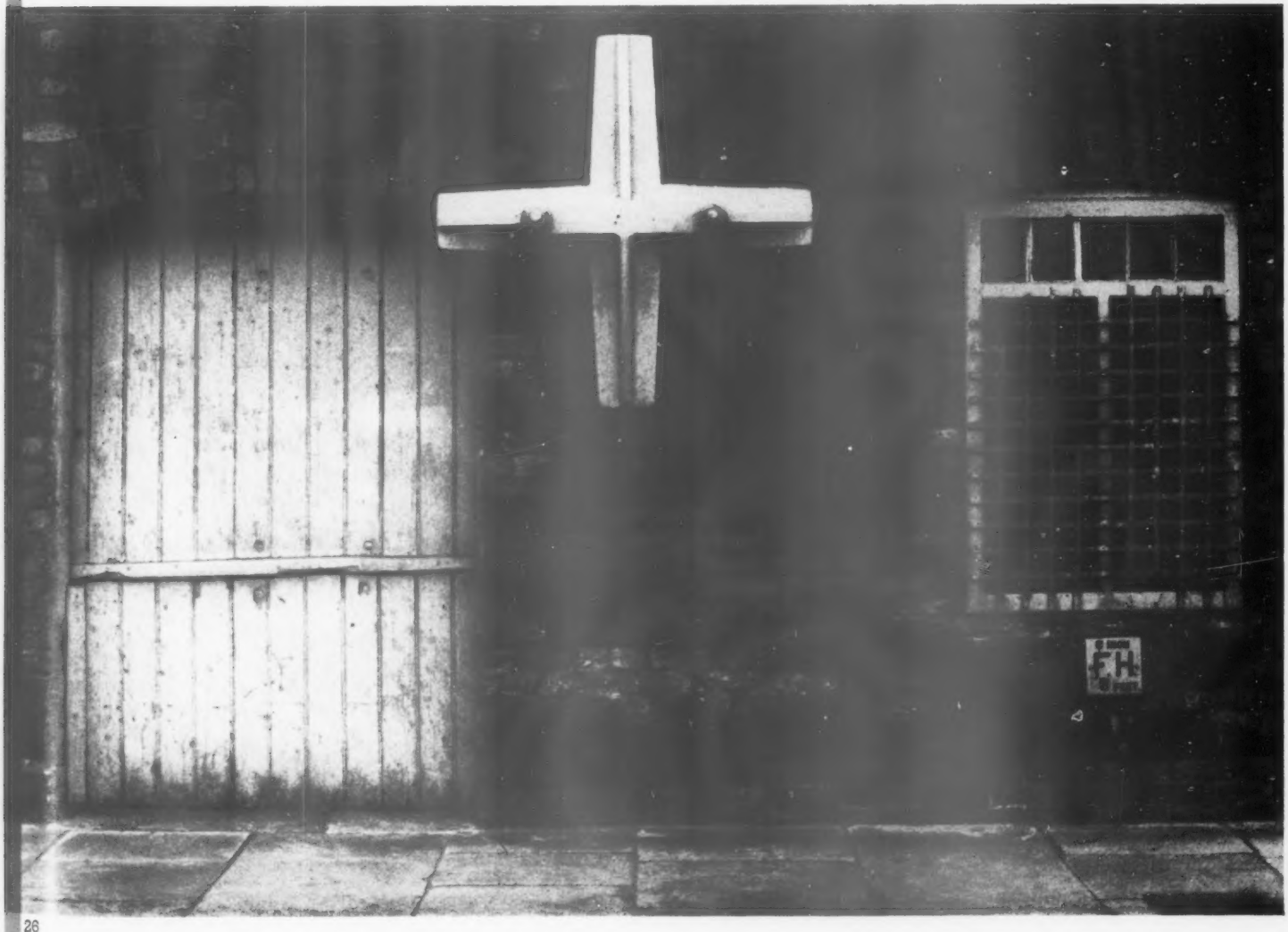
23, a warehouse - façade in white plaster at Wakefield, Yorks., beside the river, to which the small windows, variously shaped and oddly spaced, give unusual character and scale.

WAREHOUSES

24, long yellow brick warehouse at Heybridge, Essex, built in 1863 by E. H. Bentall, MP, owner of the local ironworks. Inside it has cast-iron columns supporting timber beams.

25, canal-side warehouse at Wakefield, Yorks, with the traditional arched opening forming a covered loading dock (now partly blocked). 26, a detail showing one of the boldly modelled heavy iron tie-irons typical of these industrial warehouses.

25



26

WAREHOUSES

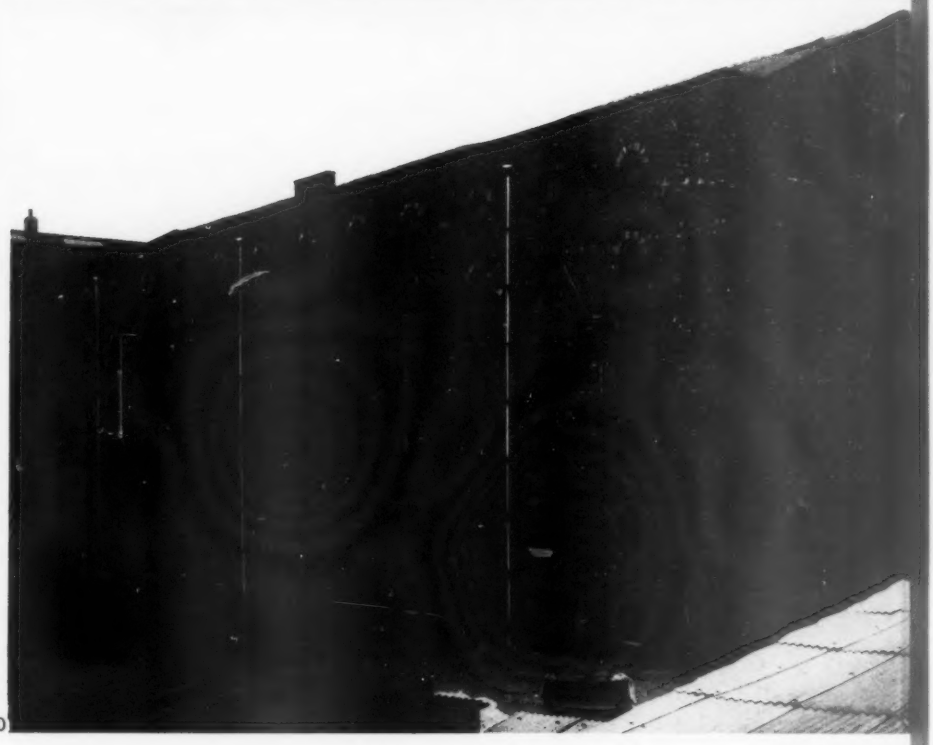
The grimmer and more industrial warehouse, of which 27, at Lowestoft, shows the type at its simplest, is naturally best seen in the industrial north and is largely a Victorian product, belonging

27

as it does to the railway age, in the same way that the earlier warehouse belongs to the age of canal and river transport. 28, grain warehouse (Yeomans, Cherry and Curtis) at Burton-on-Trent; 29, the Victoria railway warehouses at Preston Docks; 30, at the junction of the Ashton and Rochdale canals, Manchester (just before the railway age—it was built in 1836 and has a double version of the arched loading dock); 31, bonded railway warehouse at Burton-on-Trent.

28

29



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34

London has its own warehouse tradition. 32, a typical street-scene in a warehouse quarter: Cooper's Row, off Trinity Square in the northern part of the City. A 32 ft. high section of the old city wall (lower part Roman, upper part medieval) is incorporated in the wall of one of these warehouses. 33, a prewar photograph of the great warehouse (Chaplin's) that used to dominate the western side of Tower Hill, alongside All Hallows Church. It was destroyed by bombing and has been replaced by a shockingly genteel paved garden. 34, a Victorian example of the London riverside warehouse, at Queenhithe Dock, just above London Bridge, where since Roman times there has been an indentation in the river bank. In medieval times it rivalled Billingsgate (a similar indentation) in importance.

DOCKS

35

One of the finest surviving specimens of the early nineteenth-century enclosed dock, surrounded by warehouses: Albert Dock, Liverpool, finished in 1845. The buildings are red brick, standing on Doric columns of cast iron—see also page 21.

It is the more strictly architectural aspect of docks that is represented here—the ranges of tall warehouses that stand around the wharves and basins—though these reflect the powerful, forthright character of the surrounding engineering structures—the sea-walls and gates and piers and lighthouses that hark back to an older nautical tradition.

The dock warehouses illustrated are from Liverpool (which possesses the finest surviving range of nineteenth-century docks), London (where, as in many other places, the original dock buildings have been extensively altered and were severely damaged during the war, though splendid monumental groups and fragments of groups remain) and, representing the estuary port as distinct from the seaport, Gloucester, the terminal point of the Gloucester and Sharpness ship canal.

The building (all by private enterprise) of new enclosed wet docks like those at London and Liverpool (also at Bristol, Glasgow, Hull and other ports) with their attendant warehouses, was one of the major contributions made by the great engineers of the early nineteenth century, including such pioneers as Telford and Rennie, to the development of the industrial revolution. The main purpose of the enclosed docks was, of course, to enable ships to lie alongside unaffected by the rise and fall of the tide (the water inside being retained by heavy hinged iron and timber gates), but they were also enclosed on the land-ward side to stop looting and pilfering. This had become a serious problem by the end of the eighteenth century—in 1797 the year's losses by looting at the port of London alone were estimated at half a million pounds. The traditional system of lighterage had also encouraged this and even the formation, in 1798, of the Thames police force did little to stop it.

The West India merchants were the first to take drastic action, and in 1802 built the West India Docks on the Isle of Dogs and surrounded them with an impregnable wall, with guardhouses at intervals for the use of troops. This was the first of the series of towering perimeter walls that give the docks area of London their air of mystery and their fortress-like character. The West India Docks were the work of Ralph Walker and John Rennie, and consisted of two parallel sections, for import and export, separated by an avenue of great brick

36, London Docks: a typical view along the high walls that line the narrow streets leading to the dock gates.

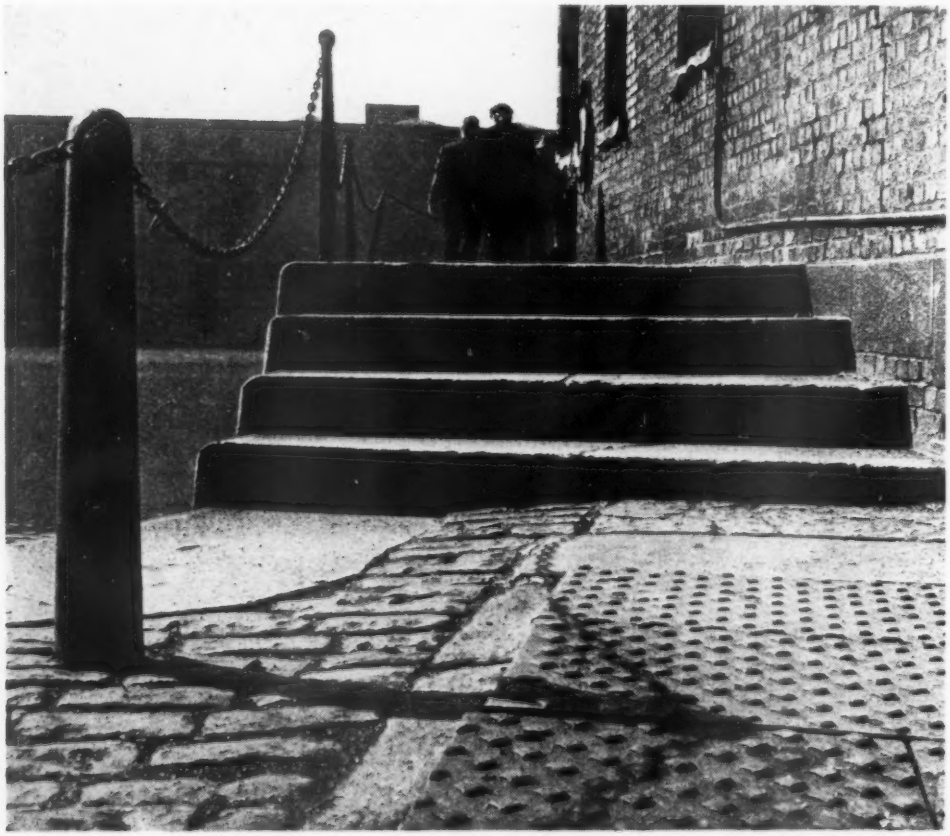
*warehouses. John Summerson describes them as 'designed and constructed with taste and precision, and serving their purpose today as naturally as they did when the biggest ships in the dock were 750-tons indiamen.' He goes on to say: 'The extraordinary engineering grace of the scheme as a whole has, of course, been diminished by alterations, and one has to refer to Daniell's dramatic pictures and the steel-engraved plans of the period to appreciate the clean lines of the approach as it was first cut in the sodden earth of the Isle of Dogs, finished with masonry and cast-iron work of superlative quality.'**

37, the office entrance at West India Dock, typical of the formal classical frontispieces which the engineers of the early nineteenth century (in this case John Rennie) provided as a foil to the great ranges of warehouses in which they were set.

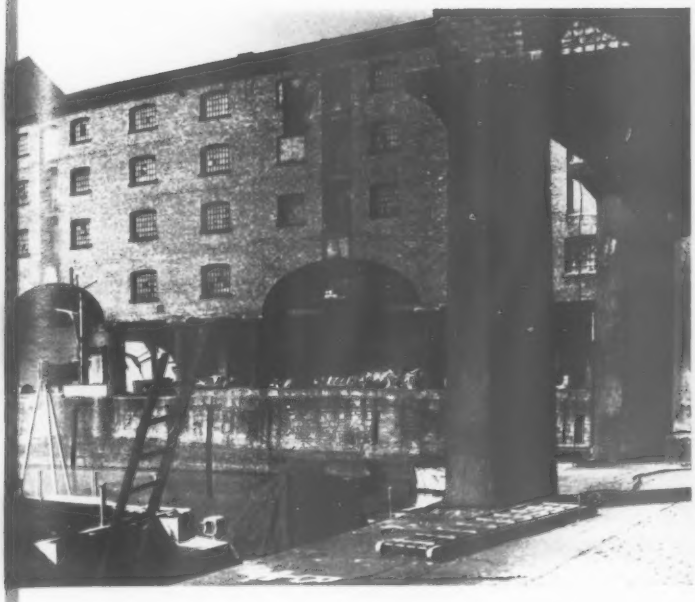
The beauties he discerns in the West India Docks are present in greater or less degree in the others that were built soon afterwards up and down the Thames: the London Docks at Wapping (also begun in 1802), the Surrey Docks on the other side of the river (begun in 1804) and the East India Dock at Blackwall, (begun in 1805) where Rennie introduced cast-iron for the roofs. Twenty years later St. Katharine's Dock was added further up-river, alongside the Tower. Built by Telford and finished in 1828, its layout has suffered the least change though many of its buildings were damaged, and some destroyed, by bombing in 1941. It is the one most fully illustrated here, along with the Albert Dock at Liverpool, which was finished as late as 1845.

Both have brick superstructures (the Albert Dock red and St. Katharine's yellow London stocks) standing on sturdy Greek doric columns of granite and cast-iron. At St. Katharine's, where the office had a Greek façade in stucco, designed by Philip Hardwick, now destroyed, the walls of the great warehouses are lightened by arched recesses in which the windows are set, adding rhythm and grace to the strength and dignity common to all these early dock buildings.

* *Georgian London*, 1945.



38, a study in materials, functionally used, at Albert Dock, Liverpool: granite setts, iron bollards, stone steps and steel covering plates. Each creates its characteristic texture, which is intensified by the effects of wear.



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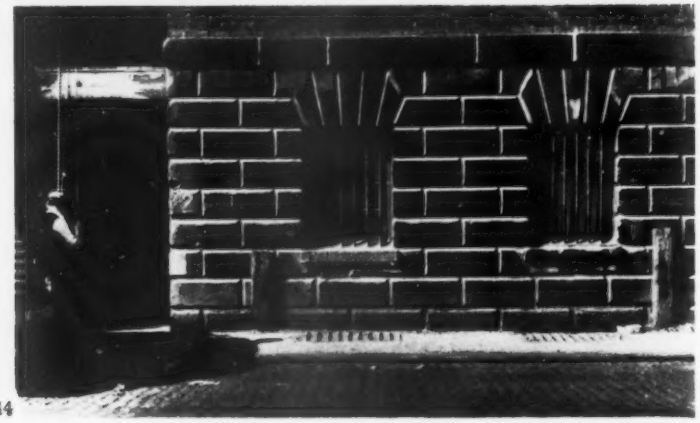
Albert Dock, Liverpool (see also page 18), where ranges of five-storey warehouses enclose the dock basin, was built in 1845 by Jesse Hartley, Liverpool dock surveyor from 1824–1860. They are of red brick with a ground-floor colonnade. The cast-iron columns are unevenly spaced, the wider spaces being bridged by a great elliptical arch. 41, below, is a close-up of one of the doorways in the south façade and illustrates, like the picture opposite, the simple robust detailing, based on the natural qualities of materials, that give these dock buildings their strength of character: in this case rounded granite buttresses to protect the door jambs, square stone loading step and iron grilles.

42

43

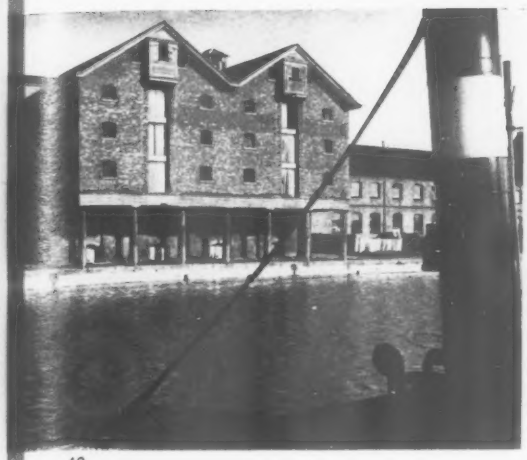


44

DOCKS

45

This tall pedimented grain warehouse at Liverpool docks is called Duke's warehouse, having been built in 1811 by the Duke of Bridgewater, to serve as a general terminal warehouse, after the construction of the Bridgewater Canal. 42 and 43, the landward side with its pattern of heavy moulded tie-irons. The rusticated base, 44, is given unusual liveliness by the fact that flour or meal, falling across it during many years, has whitened the upper surfaces of the recessed joints. 45 shows the water side of the same building, with its strange double arch within an arch. One loading-dock is seen in use (a chute leads down from the warehouse above); the other has had a mezzanine floor inserted in it.



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47

46, the Pillar Warehouse, Gloucester, built about 1849, with cast iron columns. 47 and 48, warehouses grouped round Gloucester docks, the terminus of the Gloucester and Sharpness ship canal. The buildings presumably date from the 1870s, as they closely resemble those at Sharpness (see page 9), the most obvious difference being that at Sharpness a lively pattern is created by the light-coloured shutters in the windows, whereas here the windows are dark but their painted lintols create a similar pattern.

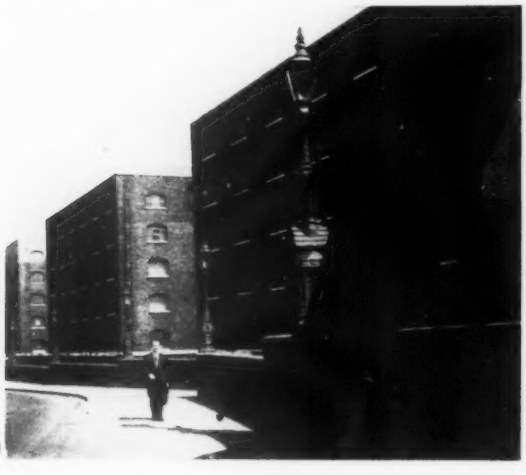
48

49

High brick walls between which the narrow paved roads wind their way are all the public sees of the older Thames-side docks and their surrounding warehouses. 49, London Dock at Wapping, begun in 1802.

51

Below and right, St. Katharine's Dock, built by Telford just downstream from the Tower and completed in 1828. 50, the row of square brick warehouses forming the west side of the dock, seen from the approach to Tower Bridge. 51, a corner of one of the warehouses from a lane to the north. 52, warehouse close-up showing the elegant arched window recesses.



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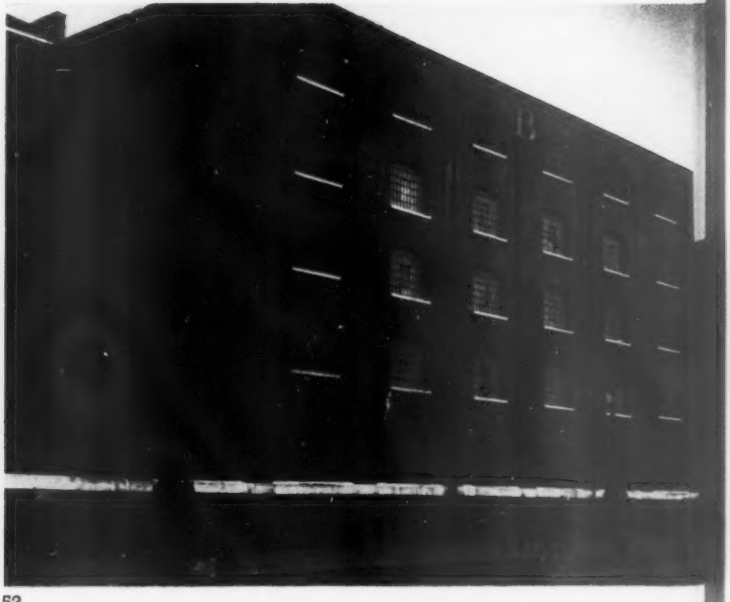


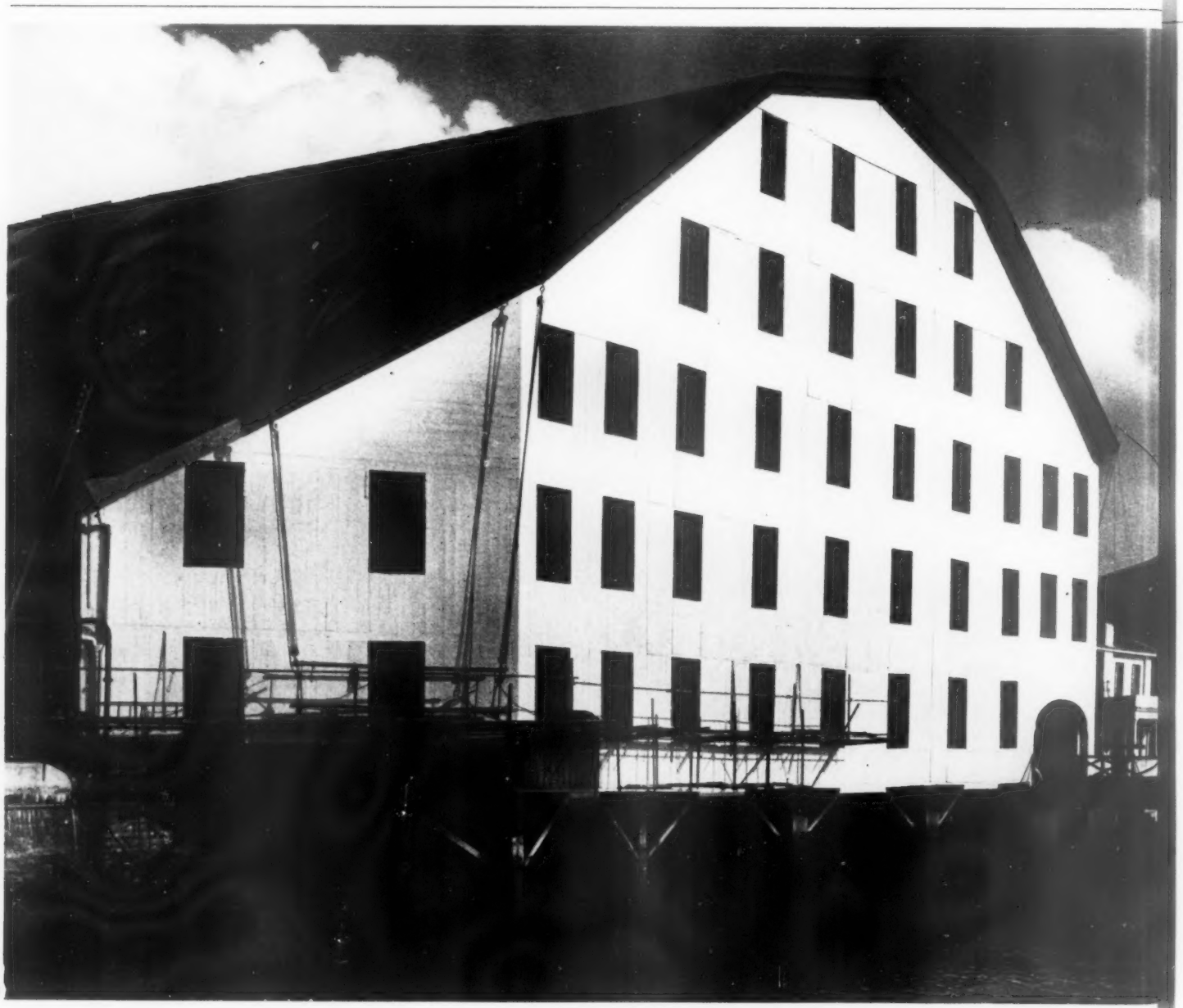
52

Inside St. Katharine's Dock. On this side the warehouses have a ground-floor colonnade with cast iron columns of the Greek doric order. The blank end walls to alternate bays of certain blocks, 54, give an impressive effect of scale.

53

54

NAVAL DOCKYARDS



53

No. 53 boat store, at Chatham Naval Dockyard, a vast timber-framed building (see interior view on page 30) and a splendid example of shipwrights' work. It was built in 1813, and it is likely that this end of the building, which faces the Medway, was originally open and that it was used for building and repairing men-of-war; in fact as a roofed-in dock—see the engraving on the cover of a similar building in use at Woolwich in 1841.

The complex of buildings known as a naval dockyard contains many facilities besides docks (wet and dry), though these were the basis of most dockyards' original creation. A dockyard (the term is now used only for naval, as distinct from mercantile, establishments) is succinctly defined in The Encyclopaedia Britannica *as 'an establishment which builds and equips warships, and has complete facilities for docking and repairing them. It supplies and perhaps manufactures armaments and ammunition, provides general and victualling stores and fuel and also contains training, medical and other establishments for the service of the personnel. It is, however, only a few of the large home dockyards in each country which are so completely equipped, and even in these only a small proportion of warships are now actually built. Government dockyards are now mainly used for fitting out and commissioning new ships and for the upkeep of the fleets.'*

The older British naval dockyards contain a medley of buildings of all periods from the seventeenth century onwards, serving (now or originally) such various purposes as stores, docks, workshops, offices, dwellings (including admirals' houses), barracks, foundries and ropewalks. They contain probably the most concentrated collection of buildings, representing at its best that functional tradition to which this issue is devoted, that exists anywhere. Nevertheless, their beauties are little known, since they are enclosed by high walls and not accessible to the public. The finest of them have been photographed for this issue (in many cases for the first time) by kind permission of the Admiralty.*

The four dockyards represented here are, in order of seniority, Portsmouth, Chatham, Sheerness and Plymouth (Devonport). The Royal Dockyard at Portsmouth was

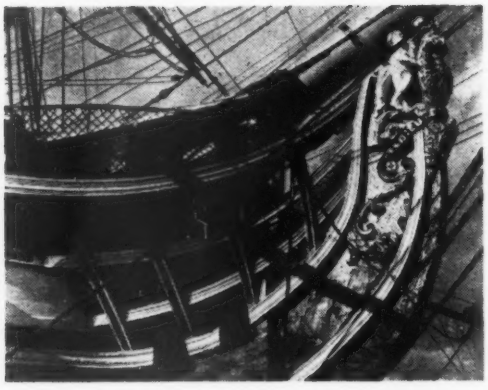
56, two well established naval traditions: the functional and the baroque. Beside No. 1 boat slip at Devonport naval dockyard (with its original timber roof of 1772) stands the painted figurehead of King William IV, 1833.

* Long low buildings in which strands of yarn were twisted (or 'laid') into ropes by men walking backwards with the strands round their waist, the other end being attached to a hook, and twisted them as they went. Rope-walks are still used, but the process has been mechanized.

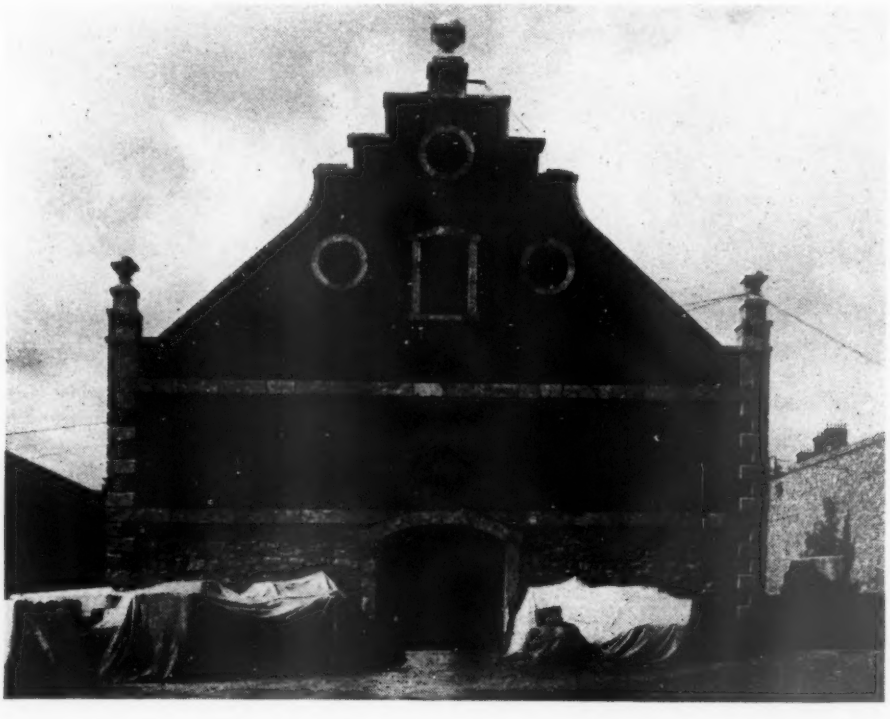
NAVAL DOCKYARDS

founded in 1540 *on a site where the first permanent dry dock in England had been built by Henry VII in* 1496—*it had primitive gates, staunched with clay, but was big enough to take the largest warship of that day, the 'Sovereign.' The dockyards at Chatham and Sheerness were begun by Queen Elizabeth I and greatly enlarged by Charles II. Although Plymouth had long been an important naval base, it did not become a royal dockyard until* 1689.

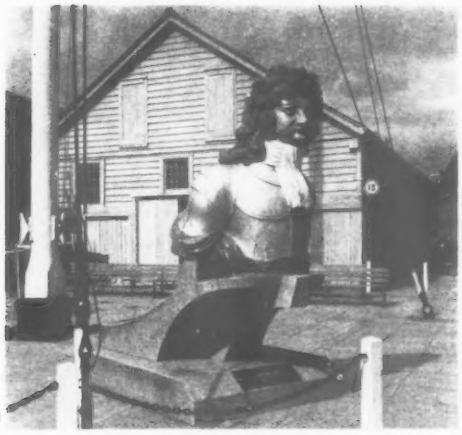
Besides their strict adherence to the functional tradition, the notable thing about these buildings is the equal virtuosity with which all the materials used are handled: brick, stone and timber as well as iron, which is employed precociously but unselfconsciously. It is natural, owing to the official nature of some of the buildings, that they should have been adorned in Georgian style with moulded gables, quoins, doorways and even somewhat formally laid out (for example, the Quadrangle building at Sheerness, with its square clock-tower, dominating a range of fine brick buildings planned by Rennie), but underlying this obedience to the sophisticated idiom of the time (and in many buildings achieving a satisfying architectural effect without any reference to it at all) is the older anonymous idiom of the shipwright and the marine engineer, who have introduced into this architecture that combination of toughness, neatness and economy of conception encountered in everything connected with the sea.



57, the carved stem of the Victory, berthed at Portsmouth, illustrates the craft of the shipwright—functional first and decorative where called for—whose qualities are echoed in the navy's shore establishments.



58, the decorative formality which adds a naive charm to the functional simplicity of some naval dockyard buildings: the south end of No. 27 stores, Devonport Naval Dockyard, built in 1769.



59

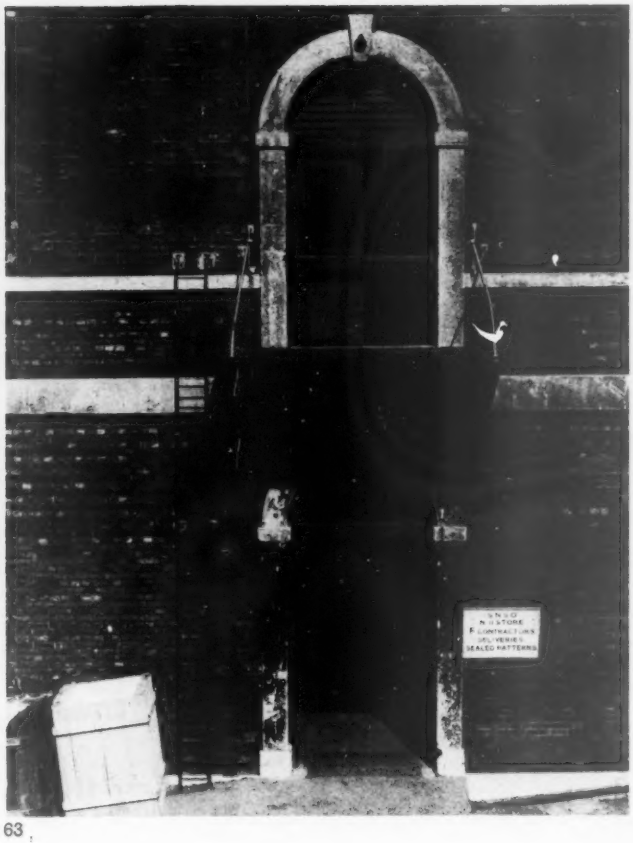
In Portsmouth Naval Dockyard. The figurehead of HMS Benbow (1813) stands in front of No. 5 Boathouse, a typical example of a shipwright's timber structure—timeless in style though in fact built in 1882.

60

61

Portsmouth has a fine range of eighteenth-century red brick buildings, in spite of losing several by bombing in the war. 60, the central archway of No. 18 Storehouse. It was built in 1770 and was formerly a ropery, being nearly a quarter of a mile long. Note how the strength of the design is not destroyed by the blocking up of one archway or the casual arrangement of windows, which have suffered much alteration. 61, the twin-gabled end of the same building (also with an uneven arrangement of windows, some being blocked up). The heavy timber floors inside are rotted with beetle and are shortly to be replaced by reinforced concrete.

62



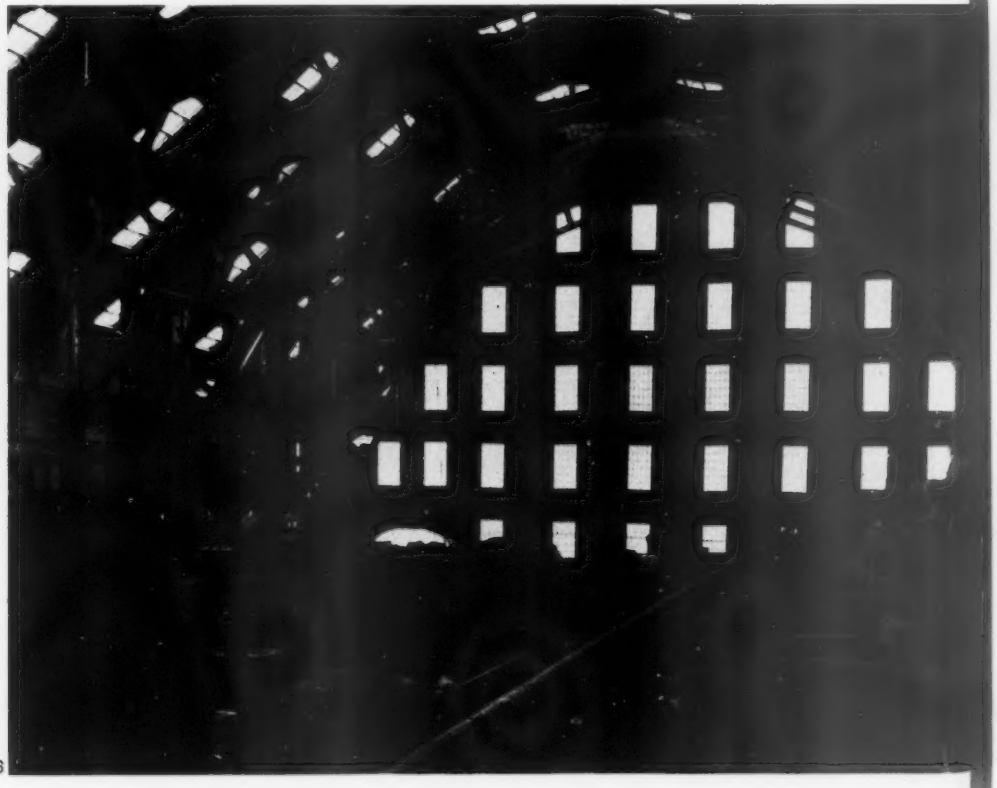
63

Dockyard architecture in its more formal aspect: 62, No. 11 storehouse at Portsmouth, built in 1778 (to the right, statue of Capt. Scott). The brick walls are 3 ft. thick at the bottom and 2 ft. 3 in. above. The floors are of timber. 63, the side doors of the same building, with plain stone trim.

64

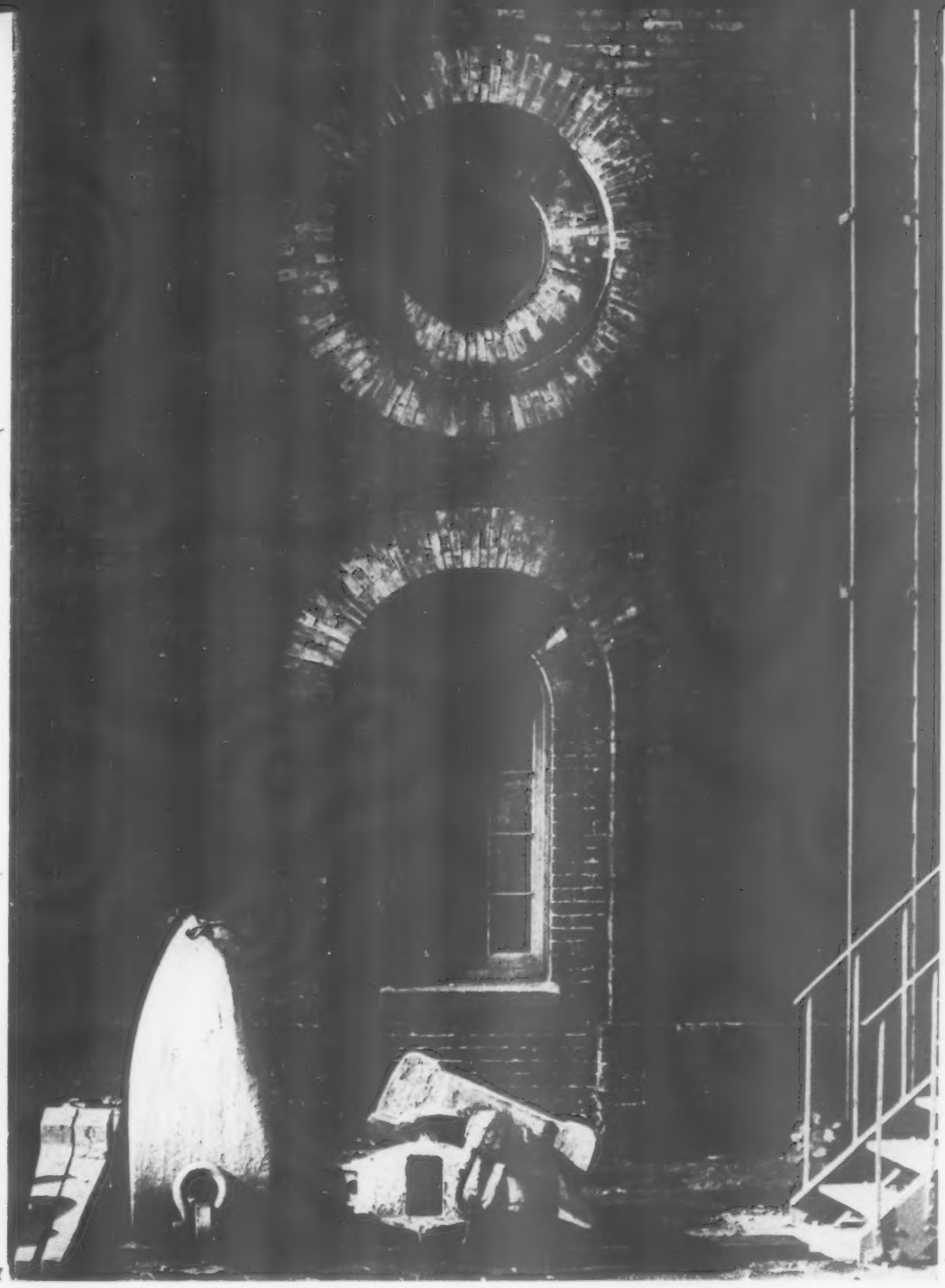
65

64, rear view of No. 60 boat store, Chatham naval dockyard, built in 1837. 65, side view of No. 53 boat store (also at Chatham—see page 26 for front view from the Medway). It was built in 1813. 66, interior of the same building showing the original timber roof.



66

NAVAL DOCKYARDS



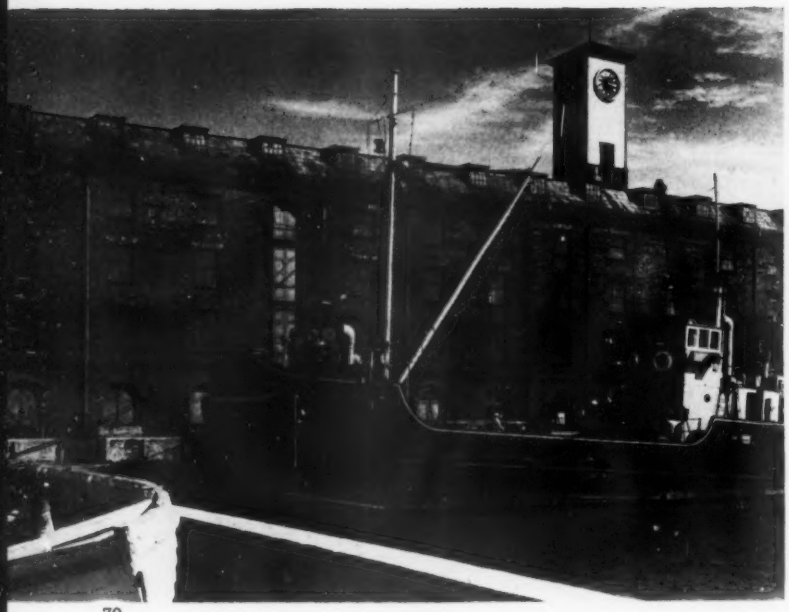
67

Sheerness Naval Dockyard uses yellow brick, often to produce bold and vigorous geometrical effects which show the functional tradition at its best. 67, the chain testing house of 1856. The dockyard was planned by Sir John Rennie, assisted by Joseph Widbey, Master-Attendant of Woolwich Dockyard, but the designs of the main brick buildings are thought to be the work of Edward Holl, civil architect to the Admiralty, and his successor George Ledwell Taylor, who also designed buildings at Chatham and Woolwich.

68 (below left), timber storehouses at Chatham, built in 1809, with louvred walls for ventilation and solid weatherboarding in the gables only. They are painted grey with white window frames and have tiled roofs. 69, the Clock Tower office at Chatham. Built in 1772, it was formerly a moulding house and the Victory's lines were laid out in the mould loft at the top. It is of red brick with timber floors and a tiled roof.

68

69



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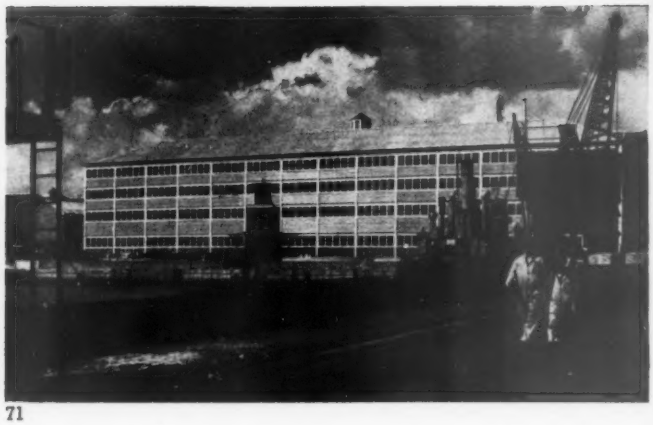
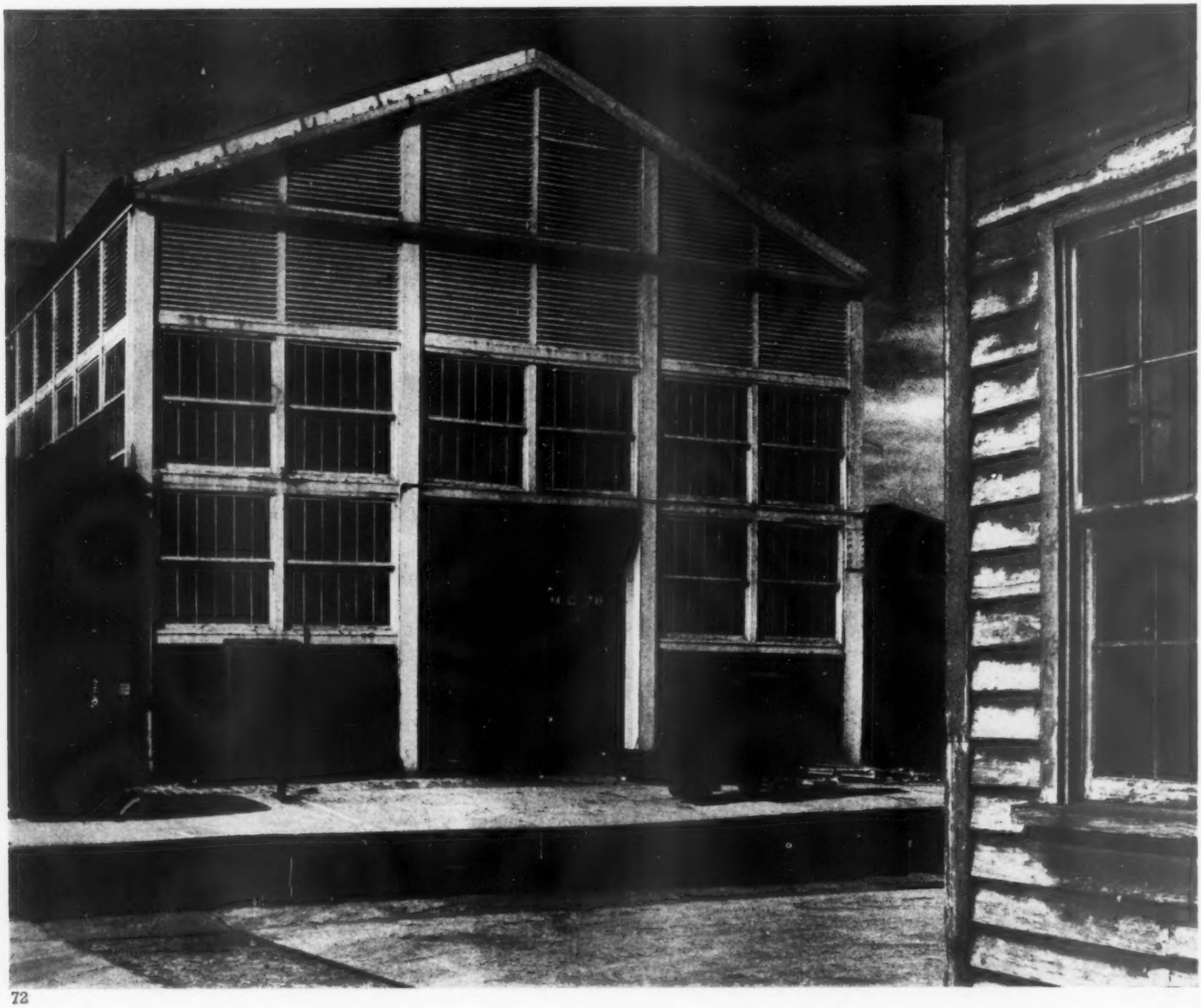


71

70, the Quadrangle at Sheerness, a square building of 1829 in yellow stock brick, containing stores and workshops. Its central courtyard is now covered over. Inside it has cast-iron columns and floor beams, in two rows to each wing. 71, a boat house of 1861. Its functionally expressed cast-iron frame makes it a prototype of many modern frame buildings. The original slate roof has been replaced by asbestos.

72, below, another iron-framed building at Sheerness: a smithy, erected in 1858.

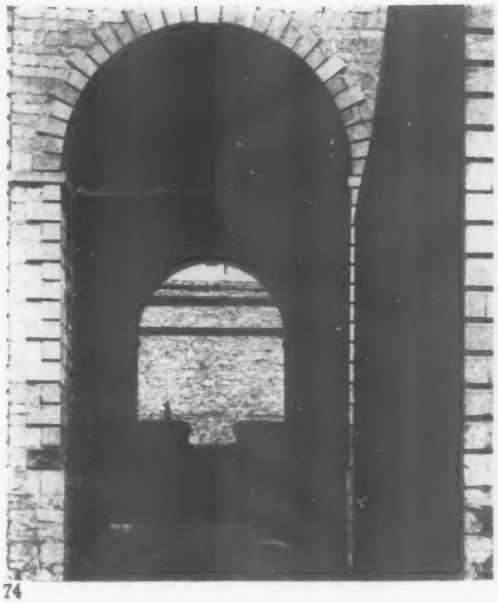


72

73

NAVAL DOCKYARDS

73, Devonport: Slip No. 1 in the Naval Dockyard, similar in style to those already illustrated at Chatham (pages 26 and 30), but this is still open at the end. It was built in 1772 and has its original timber roof.



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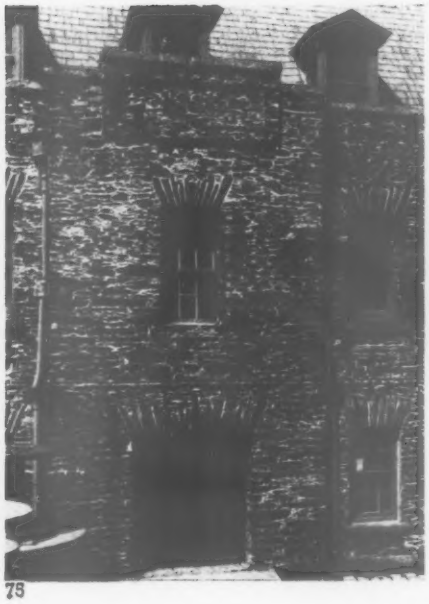


75

76

74, the central archway of No. 27 Store at Devonport Naval Dockyard, built in 1769. 75, the rough stone-built No. 4 Store at Devonport, in Marine Yard; one of a row of similar buildings, put up as barracks in 1723. 76, the East Ropery, Devonport (now No. 14 Store), built in 1814, nearly ¼-mile long. The north end was destroyed by bombing.

TEXTILE FACTORIES

The first textile mills were built where water-power was at hand. A tall stone woollen mill at Nailsworth, near Stroud, Gloucestershire, with the long 'weavers' windows' on the upper floor and a symmetrical pattern of tie-irons. It is now Bentley's piano factory.

Most of the buildings shown under this heading are (or were when they were built) what are commonly known as textile mills, but the word 'mill' applied to such buildings is misleading. They were factories for spinning and weaving wool, cotton, flax or silk, and because they were originally driven by water-power like the older water-mills for grinding corn (Latin: molere, *to grind) they borrowed the name. Water-mills are shown in the next section.*

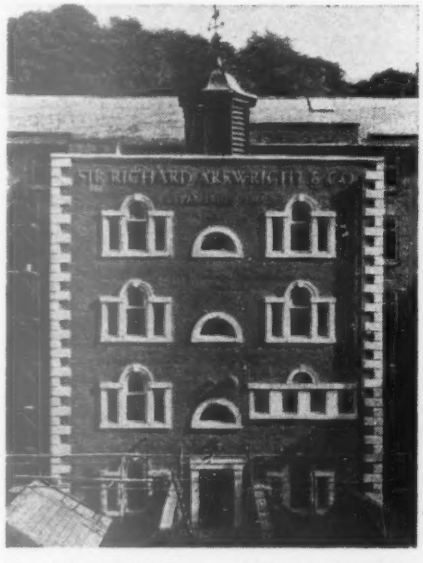
Before textile mills were established, spinning and weaving were carried out by small firms, and much of the work was done by families and individuals in their own cottages. From this practice derive the so-called weavers' windows—long horizontally linked windows lighting top-storey workshops in weavers' dwellings. They can still be seen in many parts of the country, for example the silk towns of Macclesfield and Leek, and the tradition is continued in the horizontal window found in many types of industrial buildings.

The big change came with the inventions of Arkwright, Strutt and the others responsible for the mechanization of cotton-spinning. The demand thereafter was for concentrated labour and large sources of power. Hence the number of textile factories dating from the late eighteenth and early nineteenth centuries, built not in towns but in (sometimes remote) valleys where water-power was available; for example, the Stroud valley in Gloucestershire for woollen-mills (close to the source of raw material, the sheep-farms of the Cotswolds) and the Derbyshire and Lancashire dales for cotton-mills (where the damp air was suitable for the spinning process). The earlier cotton factories were spinning-mills only, weaving remaining a home industry. With the spread of the power-loom in the 1830*'s and* 1840*'s spinning and weaving were combined in the same mill.*

These early factories are described by Prof. Turpin Bannister as 'rectangular masonry boxes with timber beams and posts supporting the several floors.' 'John Lombe's silk mill,' he goes on, 'built at Derby,* 1718-22, *set the pattern. This building was* 39 *feet by* 110 *feet, with five storeys plus the "underworks," furnishing eight large apartments lit by* 468 *windows. An* 18*-foot-diameter water-wheel activated* 26,000 *machine-wheels. Arkwright, Strutt and Need's mill at Cromford,* 1771, *Arkwright and Strutt's mill at Belper,* 1776, *and Arkwright and David Dale's mill at New Lanark, south-east of Glasgow,* 1784, *were*

* In his article 'The First Iron-Framed Buildings,' THE ARCHITECTURAL REVIEW, April, 1950.

78, 'weaver's window' in a cottage at Golcar, Yorks, a functional element repeated in many subsequent industrial buildings.

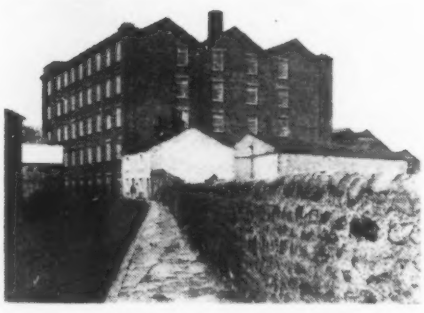


79, Arkwright's Masson Mill at Cromford, Derbyshire, built in 1783, not far from his first mill of 1771. Besides being of historic interest it illustrates the naive version of Georgian architecture with which the builders of the earliest textile factories sometimes elaborated their functional structures. It is now part of the English Sewing Cotton Co.'s factory—the inheritors of the Arkwright business.

typical solutions of this new architectural problem, but their timber-framed multi-storey system had descended through the centuries from Roman tenements, Hanseatic warehouses and metropolitan lofts.'

TEXTILE FACTORIES

And they could not for long satisfy the needs of a scientifically inquisitive age, intent on progress; especially in this instance progress in the direction of factory buildings that would be not only capacious and economical but fire-resistant. For mills and warehouses crammed with valuable goods were constantly burned down (often as a result of the friction of the primitive machinery), and the search for fire-proof building methods was stimulated especially by the destruction by fire in 1791 *of the Albion flour-mills in London (built by Rennie and Wyatt), said to be the most up-to-date industrial building in Europe. This search resulted in the evolution of the iron frame and led eventually to the great steel-framed structures of today.*



80, the persistence of the Georgian tradition, especially in the proportions and design of windows—though the smallness of windowpanes may have been functionally justified as preventing glare inside. Galgate Silk Mills, Lancashire, were built as late as 1860 (see also page 42 for another example of 1853: the Wellington Mills at Leek). The Galgate mill is now used by William Thompson and Co., and is the oldest working silk-spinning enterprise in the country.

That is what gives these early textile mills a special historic significance, over and above the great contribution they make to the enlargement of the functional tradition with which these pages are more particularly concerned. The pioneer example of iron frame construction was for long thought to be Strutt's own six-storey calico mill at Derby, begun in 1792 *and having brick segmental vaults spanning across its* 30 *ft. width and supported by beams resting on cast-iron columns. But Prof. Skempton has recently shown† that timber beams were used, so the calico mill (which has now disappeared) cannot be called an iron-framed building. His candidate for the first multi-storey building with both beams and columns of iron is a flax-mill at Shrewsbury designed by Charles Bage and begun in* 1796. *Bage was helped by the designer of Strutt's Derby mill and the Shrewsbury building has similar brick arch floors and cruciform iron columns.*

After the 1790*'s iron-framed structures developed very rapidly, but their main architectural effect is internal, providing spacious machine-halls interrupted only by the slenderest columns. Externally these massive early factory buildings display the same characteristics—the same simple response to problems boldly met—that we have seen in the warehouses and other buildings already illustrated. Walls are for the most part of local stone (the river valleys where water-power was found lie within the limestone belt), though not always,‡ but brick was more freely used later. Timber was used but little, presumably because of the fire hazard.*

As in the other types of early industrial building, Georgian features of various kinds, as well as Georgian proportions, appear almost everywhere, due no doubt to the employment of local masons and builders with inherited traditions; and it is remarkable how long the traditions persist. Many of the buildings have been drastically altered, for water-power gave way to steam-power, involving the construction of chimneys and the like, and then many of the big mills left their rural valleys to congregate in towns where reserves of labour were available, and where they were nearer to the new railways, to sources of fuel and to outlets for their products. Many of the early textile mills were converted to other uses, but most retain a great deal of their forceful architectural character, especially those in remote rural areas, where it is so surprising to come upon them.

† In a paper to the Newcomen Society, December, 1956. An article on his investigations, by Prof. Skempton, will appear in a future issue of THE ARCHITECTURAL REVIEW.

‡ The most famous of the Stroud valley mills, the Stanley Mill of 1813 (already illustrated in the REVIEW for February, 1943) has more red brick than stone—see frontispiece. It also has very sophisticated interior iron work compared with that of only twenty years earlier.

81

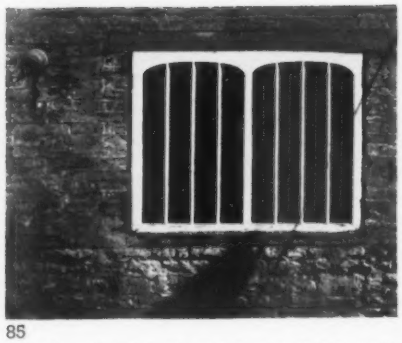
82

Two typical stone-built Gloucestershire woollen mills, with chimneys added later, indicating the change from water to steam power. 81, Dunkirk Mills, Nailsworth, the mill described in *John Halifax, Gentleman*. It is composed of three parts, dated (left to right in photograph) 1818, 1798 (the centre part by the millstream) and 1827. They are now used separately by three firms: Walker's Sticks, Kosiclad and Wright, Bindley and Gell of Birmingham, makers of umbrella fittings. 82, in the Stroud valley, which is rich in similar mills: in the foreground, the derelict Thames-Severn canal.

83

83, Ebley Mill, near Stroud, still a woollen mill and owned by Marling and Evans, who also own Stanley Mill (see frontispiece). 84, close-up showing the delicate outlines and beautiful masonry of the windows.

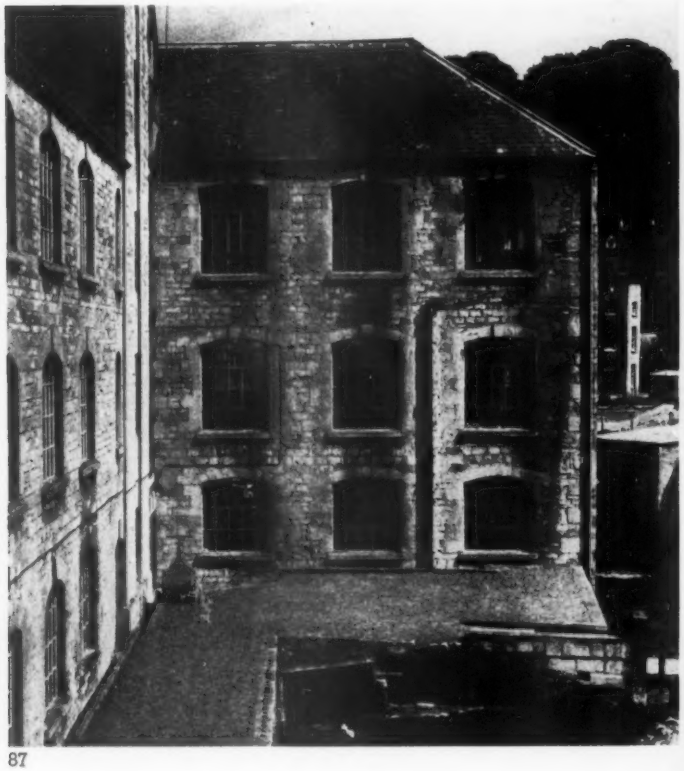
84



85

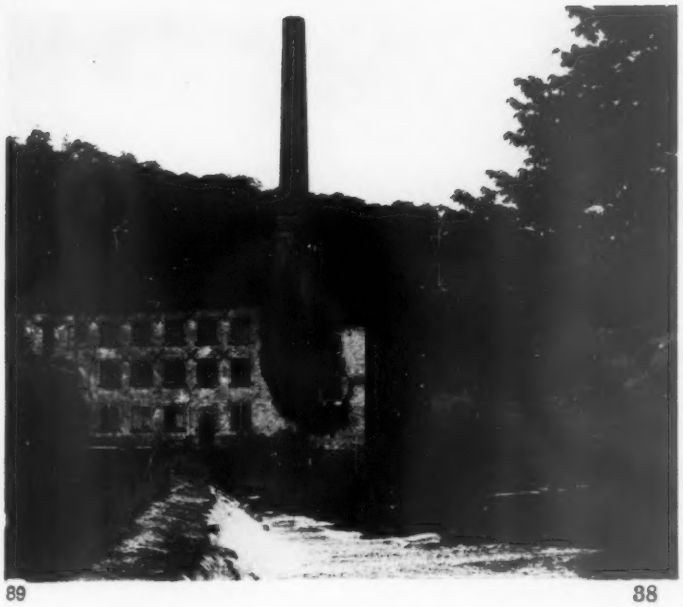
86

Window details: 85, window in brick wall of Ebley Mill, near Stroud, showing wooden frame echoing the shape of the stone head and mullion in the main part of the mill—see preceding page; 86, wood-framed windows in outhouse at Nailsworth Mill, illustrated on page 34.



87

88



89

87, another Stroud Valley mill, at Brinscombe, now Benson's tool works. The windows here are of iron, set directly into the stonework. The upper horizontal glazing bar follows the curve of the window arch. 88, Walbridge Mill, Stroud—still a woollen mill, owned by Howard and Powell. The part on the extreme right, with the characteristic horizontal window (also seen at Nailsworth, above and page 34), is as early as 1646. 89, a derelict woollen mill (one part in use for making wire fencing) dominated by its later chimney: Limpley Mill, near Bath—like the Stroud Valley mills within easy reach of the Cotswold sheep-grazing areas.

TEXTILE FACTORIES

The Derbyshire and Lancashire cotton mills have a more imposing scale and a more industrial character than the Cotswold woollen mills, but they also were established where water-power was available to exploit the inventions of Arkwright and others. Arkwright's first mill was at Cromford, near Matlock (built 1771)—see facing page. The mills on the right were also pioneer buildings associated with the pioneer industrialists. 90, Milford, Derbyshire, where the present buildings are of varying dates but the original mill was founded in 1780 by Jedediah Strutt, partner of Arkwright and responsible for some of the earliest iron-framed buildings—see introductory text. 91, Cressbrook Mill, Millers Dale, also has associations with Arkwright, but the early mill of 1779 was burnt down and the present building dates from 1815. Additions were made in 1887. The building, which is still a cotton mill, stands in a remote valley. Mill owners are said to have taken their factories to such valleys to avoid the anti-machinery rioting in Lancashire. 92, the six-storey Calver Mill, also remotely situated to the west of Curbar, near Middleton, Derbyshire, built in 1785 (see following pages). The opening in the centre of the north facade, shown below, is recent, having been made to serve the present use of the building, the manufacture of stainless steel kitchen equipment by Sissons of Sheffield. The corner turrets were probably designed for bales of cotton to be dropped down them.

90

91

92

93

94

95

Calver Mill, Curbar, Derbyshire, towers above the River Derwent (94, distant view from the south). It originally had cast iron columns inside supporting wooden beams, now replaced by steel beams except on the top floor. It is said to have been built without scaffolding, by working from inside from floor to floor. 95, close-up of door and windows seen above. The stone walls are rockfaced, up to and including the lower floor lintels, and smooth above.

96

96, Calver Mill (1785): detail of nail-studded door, with large iron-barred window over, at the end of the storehouse wing—the low wing on the left of the photograph opposite. Note the variety of textures in the stonework: coursed rough stone for the walling generally; dressed stone, bush-hammered for jambs and window-lintol; a projecting rock-face for the door-lintol, the latter echoing the more elaborate treatment of the lower part of the main building. The stone is local.

TEXTILE FACTORIES

97

98

At Calver Mill the wheelhouse, which contained the great water-wheels that supplied the power to the looms and spinning machinery, still survives, 97 above. It is a complex piece of masonry construction, with its main openings bridged by elliptical arches. But the wheels themselves have gone; they were removed for scrap during the second world war. 98, the interior, whose massive stonework still conveys an effect of the power of this primitive machinery. There were two iron wheels, separated by the stepped wall seen in the photograph.

99

102

102, typical north-country stone-built mill, with mill-stream arch at bottom of picture and the later chimney that supplanted it at top: at Barnard Castle, Co. Durham, now used by Pollock & Co.

100

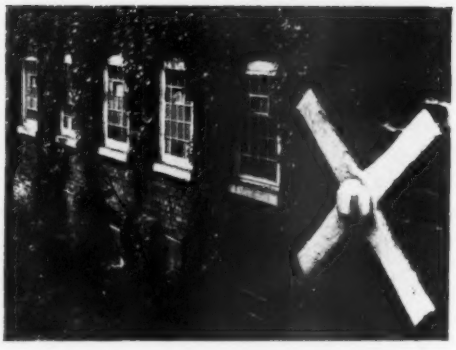
103

The woollen industry, centred to begin with in the west of England, afterwards developed in Yorkshire on a far greater scale. **103**, a typical Victorian woollen mill at West Vale, near Elland, Yorkshire.

104

104, red brick Victorian silk mill: the Wellington Mills, Leek, Staffs. Built in 1853 it is nearly seventy years later than the group of buildings on the left, yet the Georgian proportions and window style are still in use.

A well-preserved cotton mill in Cheshire, in a simple version of the Georgian vernacular: Quarry Bank Mills at Styal, near Wilmslow, built in 1784 by Samuel Greg, of Belfast (a name that still survives in the cotton industry hereabouts). The buildings are of red brick. An addition was made at the rear in 1810. The group of buildings and the village of Styal, built soon after the mill and forming with it a complete industrial community, was given to the National Trust, together with the surrounding woods, by Mr. A. C. Greg in 1939. **101**, a detail from the main block showing the cross-shaped tie-iron typical of such buildings.



101

105

Macclesfield, together with the neighbouring towns of Leek (see facing page) and Congleton, was the chief centre of the silk industry from the 1770s until its decline following the removal of the heavy import duties in 1860. 105, former silk mill in Chester Road, Macclesfield, now the card factory of Henry and Leigh Slater. 106, the long unbroken Georgian-style façade of the silk mill in Mill Lane, Macclesfield. Some of the small Georgian panes have been replaced by plate glass.

106

107

The same very small window panes occur in the White Cross cotton mill at Caton, near Lancaster (detail on right, 108). The design of such window panes was not only a matter of the survival of a style; the multiple bars served to reduce glare inside. This mill was first built in 1784, but largely rebuilt after a fire in 1838. Note the bold rock-faced stonework round the door, resembling that at Calver Mill (pages 39–41). White Cross Mill now belongs to Storey's of Lancaster, cotton finishers and makers of plastic fabrics.

108

TEXTILE FACTORIES

East Anglia was another centre of the silk industry, where it was established as a result of the arrival in England of refugee weavers from the Low Countries and later (after the Edict of Nantes) from France. This silk mill at Braintree, Essex, is still in use by Warners. The present building dates from 1858, but follows an earlier East Anglian tradition of construction in brick and white-painted weather-boarding. Note especially the long horizontal windows (in this case of iron set in a timber frame) that can be regarded as a prototype of the windows used with modern frame construction—see detail, 111 below. The interior of Warner's silk mill, 110, shows a light iron framework with cast-iron columns. The roof of the building is slate.

109

110

111

112, stone-built factory, with slate roof, at Bridport, Dorset. The plaque between the second-floor windows reads, 'Joseph Gundry and Co., established 1665, manufacturers of fishing nets, lines, twines, spinners and doublers.' It is dated 1844, but is clearly earlier; this may be the date of some reconstruction. It is still occupied by the same firm and is scheduled as an ancient monument.

113, Avon Silk Mills, Malmesbury, Wilts, now partly an antique shop and restaurant: another example of the effective use of white paint. 114, the water side of the same mill.

114

115

Red brick textile mill beside the River Colne at Halstead, Essex, built in 1883; part of the earlier Courtauld silk works—see page 48.

116

In the main street at Witney, Oxon: the classically embellished front of the hall of the blanket weavers' company, 1771—not a factory, but representing another aspect of the architecture of the wool industry on which these stone-built Cotswold towns depended.

117

118

119

117, left, the large woollen mill that dominates the river front at Bradford-on-Avon, now used by George Spenser, Molton & Co. and owned by the Avon India Rubber Co. Though tinged with Victorian eclecticism it shows the functional tradition persisting well into the nineteenth century. Above, early factory buildings of indeterminate date, typical of many that give character and variety of skyline to small country towns all over Britain. 118, at St. Blazey, Cornwall; 119, at Holt, near Bradford-on-Avon.

There is visual drama in the engineering, as well as in the architectural, works at the early textile factories. 120, a tumbling weir at an eighteenth-century serge mill at Ottery St. Mary, Devon, the only weir of this type in the country except on the Staffordshire and Worcester Canal.

120

121, a red brick yarn mill beside the Wensum at Norwich with a turret down which bales were dropped. The plaque high up on the turret reads 'Norwich Yarn Company 1839.' The builders (and probably also the designers) were Dawkins and Cattermole. The building is now Jarrold's printing works.

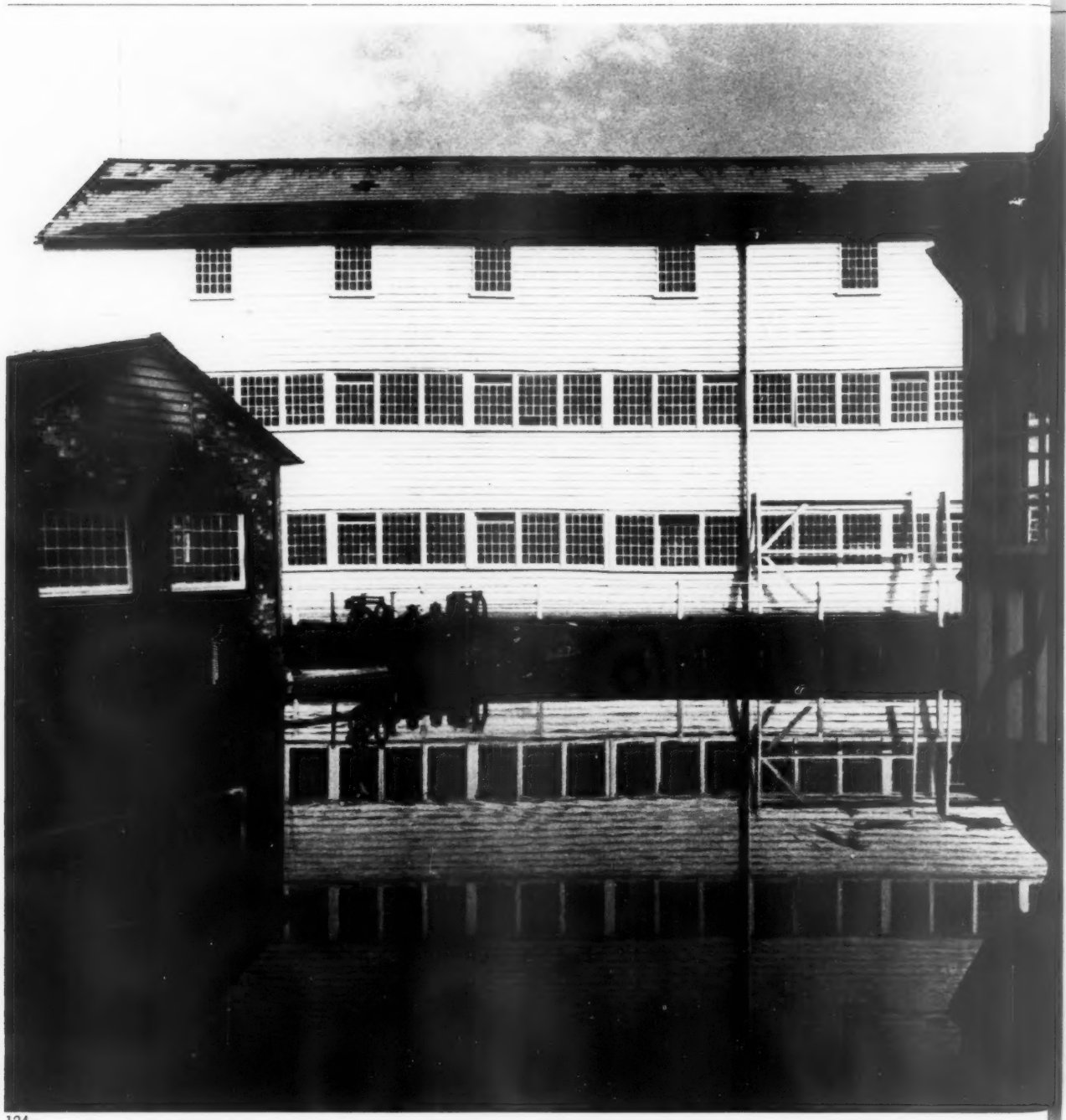
TEXTILE FACTORIES

Below, two East Anglian mills which, though not concerned with textiles, belong to the same architectural tradition. 122, linseed mill at Boston, Lincs (now Willer and Riley's dried pea and canning factory). 123, Mason's oil mill in the port area of Ipswich. The word mill is here correctly applied (see first paragraph of the introduction on page 36).

122

123

WATER-MILLS



124

124, Halstead Mill, Essex, built in the eighteenth century and the original centre of Samuel Courtauld's. It is thus not a corn mill like the other examples in this section, yet is the classic type of the East Anglian weather boarded water-mill and provides a link between this and the preceding section.

This issue has so far been concerned with buildings (except for some of those in the naval dockyards) arising out of the industrial revolution. With water-mills we go back to an earlier tradition, though many of the examples illustrated must have been built over the same span of years. Whether built earlier or later, they show that the functional tradition, though it was given new impetus and power by the opportunities opened up by the industrial revolution, has its roots a long way further back. The accumulated knowledge, and the instinct for applying it rightly, of millwrights and similar anonymous craftsmen is one of its essential sources.

The water-mill is the classic industrial building of the rural landscape, antedating even windmills (see the next section). Many more water-mills than windmills, moreover, survive in England today, and a surprising number still use water-power for grinding corn. Others have been converted to other sources of power, such as electricity. An early instance of such a conversion is the water-mill at Chilham, Kent—an unusually fine complex of red brick and weather-boarded buildings, now virtually derelict—which changed from water-power to steam-power in the nineteenth century. The consequent additions, including a sturdy chimney, harmonize completely with the original building—evidence of the strength and timelessness of the functional tradition.

The essential components of the typical water-mill are the boldly cantilevered structure housing the hoisting machinery; weather boarding (often combined with brick; white paint freely used. 125, Wickham Mill, Wickham Bishops, Essex, still in use as a water-mill.

Water-mills, nevertheless, are inevitably going out of use with the passing of the age of rural self-sufficiency (they were originally sited within hauling distance of the farms by horse-drawn wagon, and modern transport has ended the need for this). Other causes of their decline are the invention of rolling mills and the present taste for fine-ground flour, as white as possible. There is now a water-mill section of the Society for the Protection of Ancient Buildings.

Though most English rivers possess their water-mills, they are specially frequent along the Thames, where water-mills have probably existed ever since

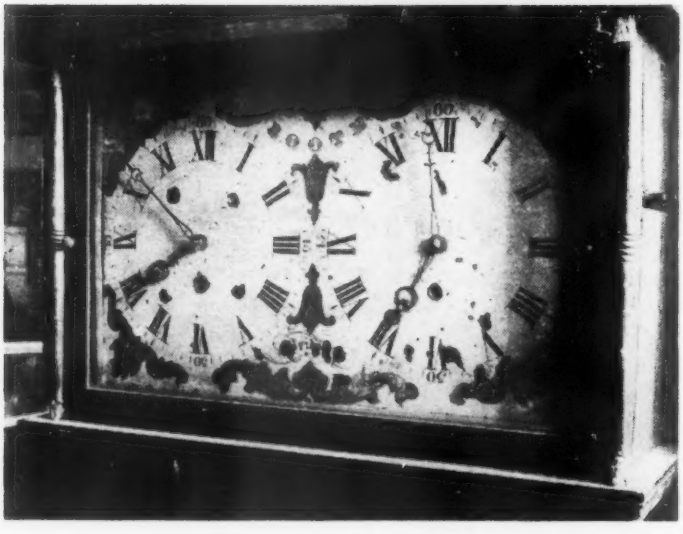
villages were established on its banks in prehistoric times. It is impossible to determine whether the Thames weirs were first built to provide a head of water for these mills or to help navigation, since the two purposes required dams in the same places—that is, wherever there was a rapid stream. In 1884, *out of twenty-six locks below Oxford, only five were without mills. Today there are still some seventeen water-mills on the tideless stretch of the Thames between Teddington and Oxford (none are left above Oxford), but not one of these works any longer by water-power. Some are disused altogether; others, like those at Goring and Whitchurch, have been converted into small electric power-stations.*

On the following pages it has been noted whether the example illustrated still works or not, but for the purpose of this issue neither that nor the charming picture created by their setting among idle or moving waters, shaded by trees and fringed by reed-beds, is so important as the established architectural vernacular of the buildings themselves, which unlike their machinery does not go out of date. The buildings are mostly of timber—at least in the Midlands and the south and east of England—and so originally was the machinery. It often had gears of hard apple-wood, though much of this was later replaced by iron. The post and lintel timber construction with superimposed cladding gives the buildings affinities with modern frame construction, some of whose characteristic features, like the long horizontal window, are part of the traditional millwrights' vernacular.

A feature common to nearly all water-mills is the boldly projecting structure framed in timber, sometimes carried on brackets, sometimes cantilevered clear from the wall, which houses the hoisting tackle. This raises the sacks of grain delivered from the farms into tall storage lofts from which it descends by force of gravity to the grinding chamber. The milled flour then passes into the lower buildings alongside, where it is stored in bags. Water-mills gain much of their architectural effect from the contrast between these long low ranges of weather-boarded buildings (usually painted white) and the tall granaries with the bold geometry of their hoist housings, all doubled by reflection in mill-stream or pond.

126, one of the surviving Thames water-mills: Hambledon Mill, Bucks. It is still a mill, though no longer worked by water-power (the iron wheel in the foreground is not the mill-wheel but part of the lock machinery).

Surviving articles of mill equipment at Pyemore Mill, near Bridport, Dorset: 127, iron water-wheel of 1887 (inside the building some of the gears are of apple-wood); 128, a Victorian clock, made by Booth of Bridport. The left-hand dial is an ordinary time-keeper; the right-hand is geared to the water-wheel and adjusted to keep time with the other dial if the right amount of water is passing over the wheel.



WATER-MILLS

129

130

131

Pyemore Mill, near Bridport, Dorset, a more substantial building than the others illustrated here and, like Halsted Mill (page 48), forming a link between the water-powered grinding mill and the textile mill, since it has served as both. It was built some time before 1800 as a grist and linseed mill but was later converted for flax and hemp spinning, when the parts shown in 130 and 131 were added. After five generations have used it as a spinning mill, it has just closed down owing to the difficulties of obtaining labour locally. Part of the building is now used for small boat building. The river is the Brit.

132

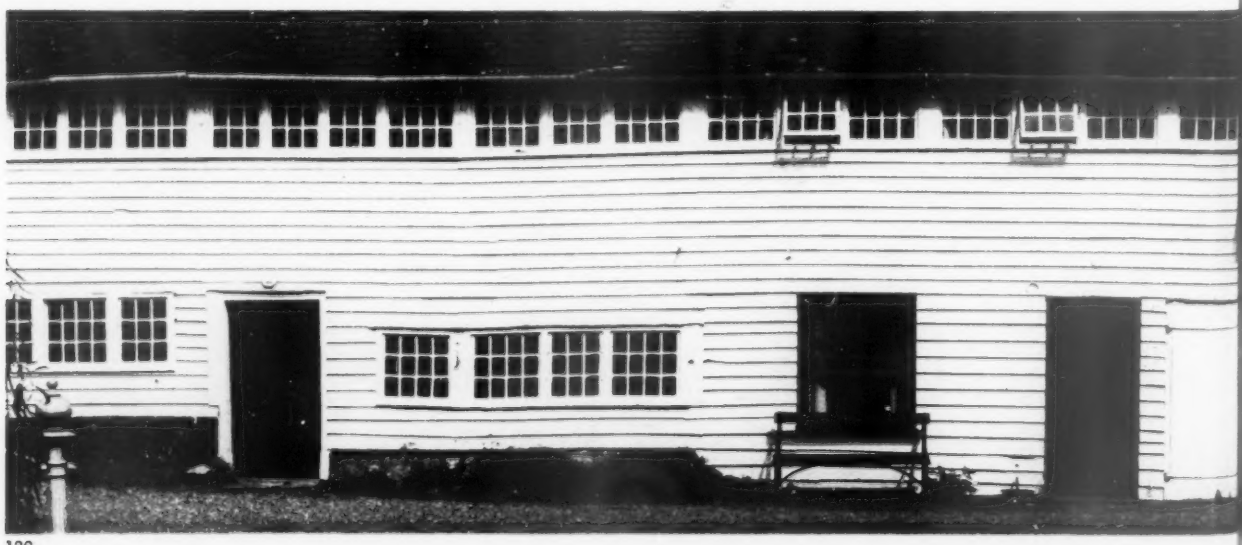
133

134

135

The features most characteristic of water-mills are white-painted weather-boarding contrasting with brick-work, the gabled structures that house the hoisting tackle, breaking into the skyline, and windows irregularly arranged to suit function rather than taste, but satisfactory in the pattern they create. 132, at Wickham, Essex, a Georgian mill owned by James and George H. Matthews and still working. 133, at Chartham, Kent, no longer working and used by the Kent River Board as their Stour Area depot. 134, at Chelmsford, Essex (still working; owners, W. H. Marriage and Sons). The boarded part is Georgian; the rest, in yellow brick, Victorian. 135, at Farningham, Kent; now a private house; the right-hand door and fanlight are faked.

The longitudinal window is another characteristic feature of these timber-boarded water mills: 136, at Coggeshall Mill, Essex.



136

WATER MILLS

137

Coggeshall Mill, Essex, still working as a grist mill, but no longer by water-power. A medieval mill stood here first, owned by the local monastery. A new one was built in 1600 by refugee Flemish velvet weavers, to whom the roof-shape of the present buildings as well as the window-style (see 136) are attributed. It was converted to steam power in the nineteenth century. 138, the typical white-palinged footway across the mill-stream. The river is the Blackwater.

138

139

139, 140, another water-mill converted to steam-power in the last century, but now used as a farmhouse and partly derelict: Chilham, Kent, on the Stour.

140

141

142

Horstead water-mill, near Coltishall, Norfolk, fine in scale and particularly well placed on the River Bure. It is still working by water-power. The arches carrying the boarded superstructure are of whitened brick. 143, side view, looking into the driveway beneath the main building which passes behind these arches.

143

144

145

At Sawbridgeworth, on the Herts-Essex borders: a complex of weather-boarded buildings, yellow painted and with slate instead of the more usual tiled roofs, by the River Stort. It is still a flour mill, owned by T. Burton, but it no longer uses water-power.

146

147

146 and 147, Bocking mill, Essex, on the Pant, still working by water-power. Though there is no design behind their composition, the functionally determined arrangement of planes and angles gives such buildings vigour and their own kind of coherence. Note again the casual placing of windows, which the eye does not find distracting.

148

149

Elstead water-mill, Surrey. It has a tall brick central portion of elegant Georgian character, surrounded by lower wings of brick and weather-boarding, with the characteristic mill and workshop windows, vertically subdivided. It is all eighteenth century, and has been used for corn, malt and fulling. Although it is now a private house, the mill remains in working order. The river (150, below) is the Wey.

150

151

On this page are some mills from the north and west of England, very different in character from the timber-boarded water mills of East Anglia and the Home Counties. 151 (left), a red-brick corn mill owned by F. E. Stevens at Sherdlow, Burton-on-Trent, built in 1780. It may however originally have been a warehouse; the wide arched opening resembles the covered loading dock common in canal-warehouses, such as 5, 25 and 30 (pages 10, 15 and 16). It still grinds corn, but no longer by water-power.

153

152 (left), stone-built water mill at Garstang, Lancashire, in farmhouse style, no longer working. 153 (above), at Chippenham, Wilts, also of stone and resembling in style the early textile mills of the same region—for example, 112 and 113 (page 45). It belongs to Pound, Taylor and Collins, flour millers, but is due to be demolished soon to make way for a row of shops.

154, tower mill at Boston, Lincs (see page 60): looking up from beneath the gallery. This kind of robust timber detail has a timelessness that allows the modern architect to learn from it without being guilty of archaism.

Windmills have already been fully documented and their beauties are well known. They are, therefore, only briefly represented here. They cannot be omitted because, leaving aside their familiar role as romantic objects in the landscape, the architectural form they have evolved is a first-rate example of the challenge of function producing a style of architecture both elegant and robust. The vigorous detailing of things like balcony railings is particularly noteworthy, and meet for modern architects to study; so is the simple use of contrasting materials—brick and white-painted or black-tarred timber.*

Water-mills (see previous section) seem to have preceded windmills, the latter being used where no water-power was available. Mr. Wailes notes that no mills are recorded in western Europe at the time of Domesday Book, the mills mentioned there being either water-mills or cattle-mills. The earliest references to windmills in England occur in the twelfth century when they were evidently still a curiosity. A century later they were familiar objects. They were regarded as portable property, capable of being moved from one site to another. The first windmills were of the type known as a post-mill; that is (Mr. Wailes's definition): 'a box-like timber body, carrying the sails and containing the machinery, is mounted on a massive, upright oaken "post" on which it can turn.'

The other kind of mill, with a fixed body, is known as a tower-mill, though a timber-built, weather-boarded tower-mill, painted white, is often called a smock-mill because of its resemblance to the pattern of a countryman's smock. It is usually eight-sided, but may be six, ten or twelve-sided, and has a brick base anything from a few feet to a

* Notably by Mr. Rex Wailes. See his *The Windmills of England*, Architectural Press, 1948.

155

156

Right, two windmill rarities. 155, the only eight-sail windmill left in Britain: at Heckington, near Sleaford, Lincs. Usually there are four sails. Heckington Mill (a tower mill —see overleaf) originally stood on the site of Boston Docks, but was re-erected in a burnt-out tower. It was taken over by Kesteven County Council in 1951 and is now in good condition. 156, an unusually tall tower-mill (with sails replaced by the wheel of a modern wind-pump) attached to a five-storey mill building: Leach's Mill, Wisbech, Cambridgeshire.

couple of storeys high. In other tower-mills the main structure is all brick. The revolving caps, carrying the sails, windshaft and brake-wheel, are the crowning feature of tower-mills, each part of the country having its own traditional design of cap.

*Windmills are located in corn country where there is need for grinding grain; also in fen country where they are used for land drainage, though strictly these are not windmills but wind-*pumps. *At one time there were said to be as many as ten thousand windmills at work in England, but other sources of power long ago deprived them of their place in the rural economy. In* 1945 *Mr. Wailes estimated that there were less than a hundred still performing their original function. Happily the windmill, like the windjammer, was superseded at the moment when it had reached its peak of development and unselfconscious beauty. Hence the aesthetic appeal of the specimens that survive.*

157

158

The basic types of windmill. 157, a post-mill, the most primitive type, in which the whole upper part of the building revolves on its base: Mountnessing Mill, near Ingatestone, Essex. 158, tower mill, in which only the cap, carrying the sails, brake-wheel, etc., revolves: the Maud Foster Mill, Skirbeck, Boston, with five sails—the last of the Boston mills to work by wind. 159 (below), Smock mill—a tower mill with the main structure above the gallery of timber, weather boarded and painted white: at Willesborough, just outside Ashford, Kent. In Kent the sails are called sweeps.

159

160 (right), detail of doorway at the Boston windmill shown opposite and on page 58: a painted battened door set in the round base of the tower. Note how the brick reveal is also painted, emphasizing the shape of the opening; a traditional practice deriving presumably from the painter's convenience (it is easier to make a clean line at an external than an internal angle) and from the advantage of a white surround to make the aperture still easily visible when the door is open.

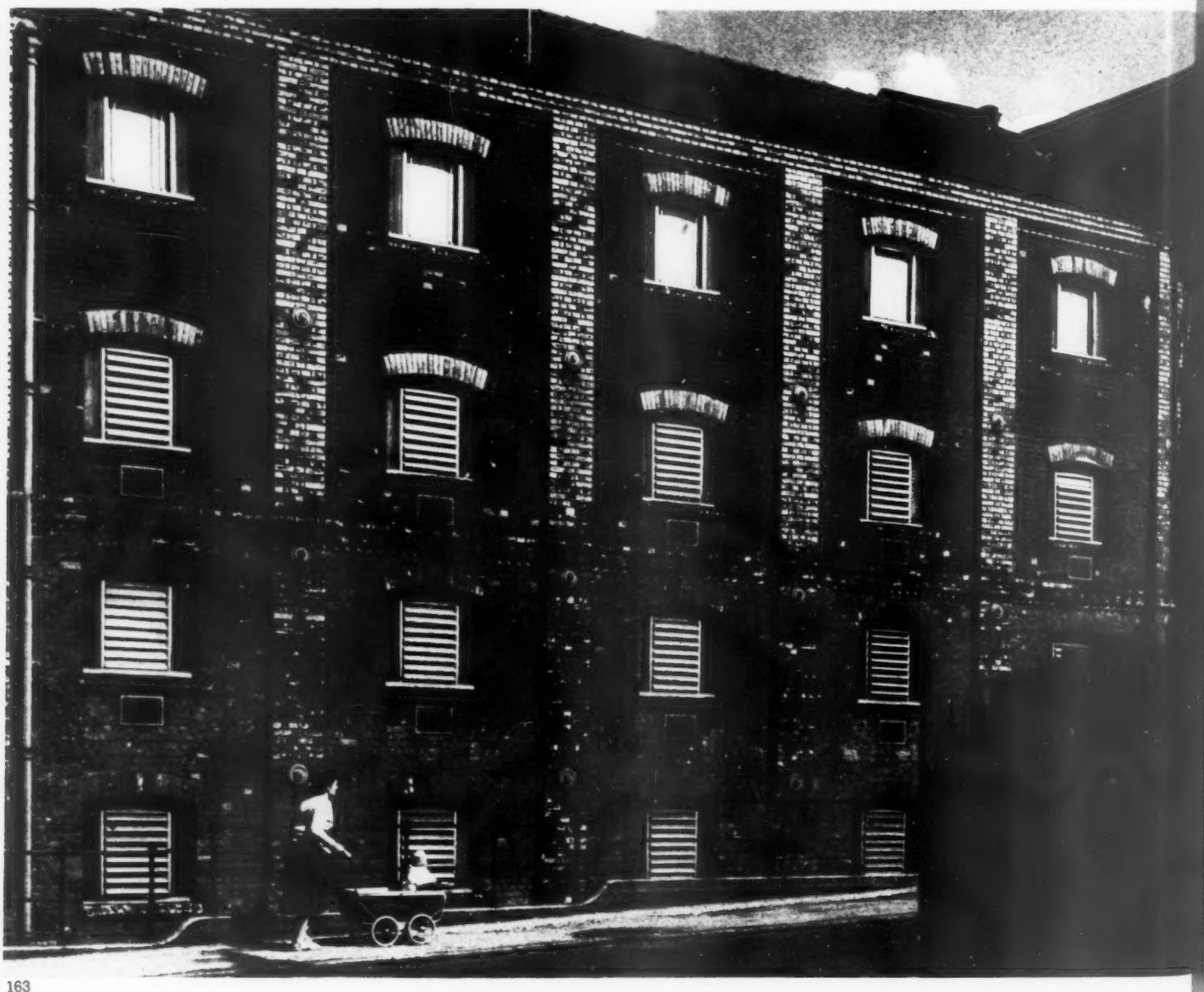
160

161

Cranbrook mill, Kent, one of the best surviving examples of the smock mill. It is still working. The tablet above the upper door reads 'Henry Dobell, 1814, Humphrey Builder.' The mill is painted grey and white. The delicately designed gallery, 162, is of iron.

162

BREWERIES, MALTINGS AND OAST-HOUSES



163

In the whole wide range of anonymous industrial architecture, maltings are probably the buildings whose beauties have been least noticed. They have neither the rural charm of water- and wind-mills nor the romantic associations of the pioneer textile-mills. They are mostly nineteenth century—the red and yellow panelled brickwork, and the use of projecting brick courses in this example at Mistley, Essex, are typically Victorian—yet their direct response to the challenge of function gives them the same vigour that the earlier buildings display, and the robust detailing of features like their characteristic louvred windows is especially rewarding for modern architects to study—see close-ups of some of these windows on pages 68 and 71.

The brewing of beer was one of the first activities to undergo the transformation from home to factory—in 1419 *there is a record of no less than three hundred breweries in London. It was not, however, until the eighteenth century that brewing became almost wholly industrialized in London, and not until the Victorian era that the process was completed elsewhere. Before then the wealthier classes brewed their own beer, and for long afterwards many farmers brewed beer for their labourers, and publicans for their customers. The latter practice died out as the tied house system spread during the nineteenth century.**

As far as can be discovered no brewery buildings earlier than the eighteenth century still operate in England, but there are several fine examples of this time.† Although large towns and cities have their breweries, it is essentially an industry of the small country town, where the brewery is often one of the most satisfactory buildings. A brewery must be sited near a good water-supply, not only for brewing but for steam-raising and cleansing. At Burton-on-Trent the whole town is devoted to the brewing industry, owing to the exceptional suitability of the local well-water for brewing pale ale, but the existing buildings are mostly late Victorian or Edwardian and provide but few illustrations of the functional tradition at its purest.

The unmistakable geometry of the brewing industry: the pyramidal roofs of maltings, breaking the skyline with their capped vents, and the long low brick buildings with square, louvred windows. 164, Banks's maltings beside the canal at Langley, Worcs.

A brewery of the normal type is arranged either on the tower system, in which the raw materials (malt, hops, water, etc.) are first hoisted or pumped to the highest point and the wort (or beer in process of manufacture) descends by gravitation as it passes through its various processes, or (in larger breweries) on a horizontal system with pumps employed to raise materials or wort as required. The cooling of the wort after the incorporation of the hops took place in old breweries by letting it lie in shallow open vessels; in modern ones refrigeration is used. The next stage is fermentation, usually completed in four or five days. Some draught beers are then matured in cask for varying periods according to their strength; some are chilled, filtered and carbonated; some are 'naturally conditioned' in bulk storage tanks. Bottling is another complicated process. A brewery is, therefore, a complex affair: the malt-house, hop room, sugar-store, brew-house,

* William Cobbett wrote in his *Cottage Economy* (1821) that 'forty years ago there was not a labourer in his parish' (that of a large Sussex farmer) 'that did not brew his own beer; and now there is not one that does it, except by chance the malt be given him. The causes of this change have been the lowering of the wages of labour compared with the price of provisions . . . the enormous tax upon the barley when made into malt; and the increased tax upon hops. These have quite changed the customs of the English people as to their drink. They still drink beer, but in general it is of the brewing of common brewers, and in public houses, of which the common brewers have become the owners.'

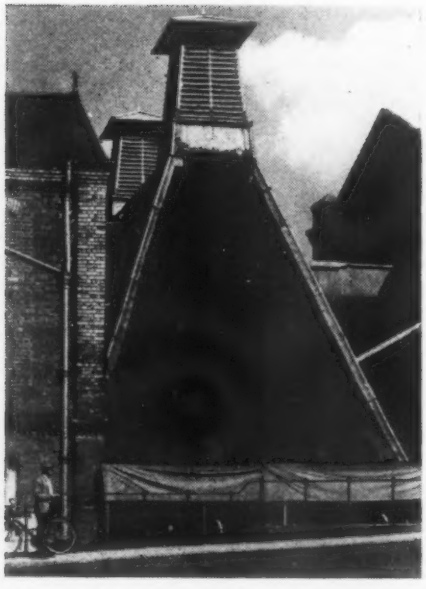
† Also brewers' houses, which adjoined the breweries. These are outside the scope of this issue but will be dealt with in a separate article by Mr. Brian Spiller, to be published shortly.

fermenting-room, cellars, cooperage, stables, vehicle sheds, maintenance shops, bottling store and offices require considerable space, and there are also power and heating plants. The buildings often surround a yard, enclosed within a high wall.

Next to the breweries themselves, the most important buildings serving the brewing industry are maltings, where barley is converted into malt by encouraging, and then arresting, the process of germination. Many breweries possess their own maltings, but independent maltings are very numerous, especially in country towns in the Home Counties and East Anglia. They are unmistakable on account of their kilns with steep pyramidal roofs.

Leaving aside the recently introduced system of drum-malting, in which the barley is germinated in revolving drums through which moist or dry air at various temperatures can be passed, the system used in England is that known as floor-malting, involving a rectangular building of several storeys with cisterns at one end and kilns at the other. Here the barley passes through a sequence of processes, occupying several days, including steeping in the cisterns, 'couching' to enable it to gather heat, turning, drying and finally curing in the kilns. After this it must be dressed and polished, weighed and sacked and stored until the finished malt is discharged, all of which requires substantial subsidiary buildings, as in the case of a brewery.

Most maltings now in use date from the nineteenth century. The main building—the flooring block just referred to—usually has three floors, but with a height from floor to ceiling of only about six feet or even less. It has regular small windows, usually squarish in shape, serving as vents and filled with louvres—thus arises the typical exterior facade of a malting: long and low with blind apertures given depth by the robust detailing of the louvres, and also given interest by the fact that the building is often strengthened by cross-ties which appear on the outside in the form of regularly spaced heavy iron crosses or round or oval plates. Providing a geometrical contrast to this building is the kiln or group of kilns at one end of it—tall with pyramidal roofs, usually tiled or slated, crowned with vents whose vigorous shapes are usually seen silhouetted against the sky.



165, malt kilns at Mistley, Essex (Free, Rodwell and Co.): steep slated roofs, crowned with louvred vents. The typical nineteenth-century panelled brick flooring-block of the same maltings is shown on page 62.

The oast-house, for drying hops, is the third type of building that serves the brewing industry, and the bold shapes of its early circular, and later square, towers (either single or in groups) are familiar features of the Kentish countryside where three-fifths of all English hops are grown, originally for reasons of soil and climate and now also because of the specialized labour and experience available there. The kiln, built of brick and about twenty feet in diameter, has a tall conical or pyramidal roof which terminates in an opening about three feet in diameter, surmounted by a wooden cowl. The cowl is pivoted and provided with a vane to keep the opening turned always away from the wind. The design of the cowl —painted white, in sparkling contrast to the dark red brick and tiling of the tower it crowns—is a first-rate example of a shapely form arrived at by the long process of trial and error. Oast-houses are usually seen as part of a group of farm buildings, but the latter are outside the scope of this particular issue, devoted as it is to early industrial buildings, to which category oast-houses belong only by virtue of the expression they give to a specialized technical activity. The very great contribution that farm buildings, and the rural craftsmen responsible for them, have made to the functional tradition over several centuries is a different story.

BREWERIES

166

167

The city brewery: 166, Courage's at Butler's Wharf, just downstream from Tower Bridge, London, facing St. Katherine's Dock; 167, Bullard's Anchor Brewery, Norwich, 1868, in red brick—another example of the long persistence of Georgian motifs.

168

169

Cobb's Brewery, Margate, built of yellow brick: 168, the main façade (the plaque beneath the pediment reads 'Foundation laid 6th July, 1807. Brewed in 6th July, 1808. Wm. Teanby, Architect'); 169, the approach from King Street, leading to the unusual circular brewhouse.

170

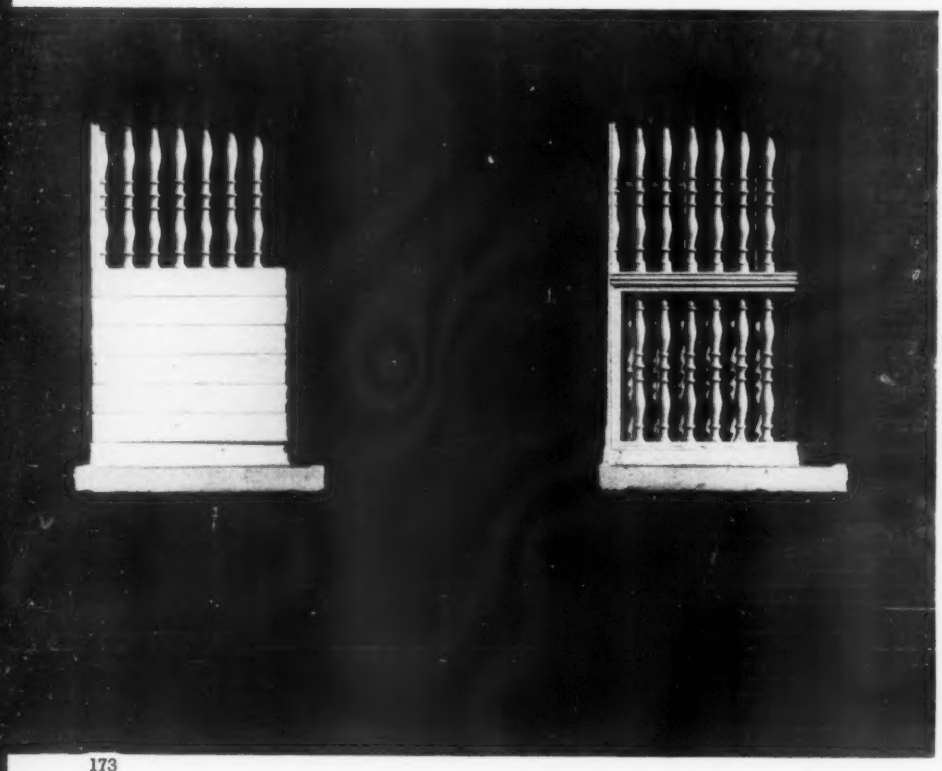
171

A contrast in brewery styles, both from Norwich: 170, the timber-framed superstructure of the Crown Brewery, King Street, with variously shaped windows crowned by a louvred storey; 171, Anchor Brewery, Costany Street, (about 1868), in painted brick with an od combination of horizontal window and Georgian stable-block style.

BREWERIES

172 (right), Simpson's Brewery in the High Street at Baldock, Herts—yellow brick in front and red behind, relieved by white-painted woodwork. Ground-floor windows and fanlights are fitted with a grille of turned wood balusters of unusual elegance—173 and 174 below: windows white; door a fresh green.

172



173

174

175

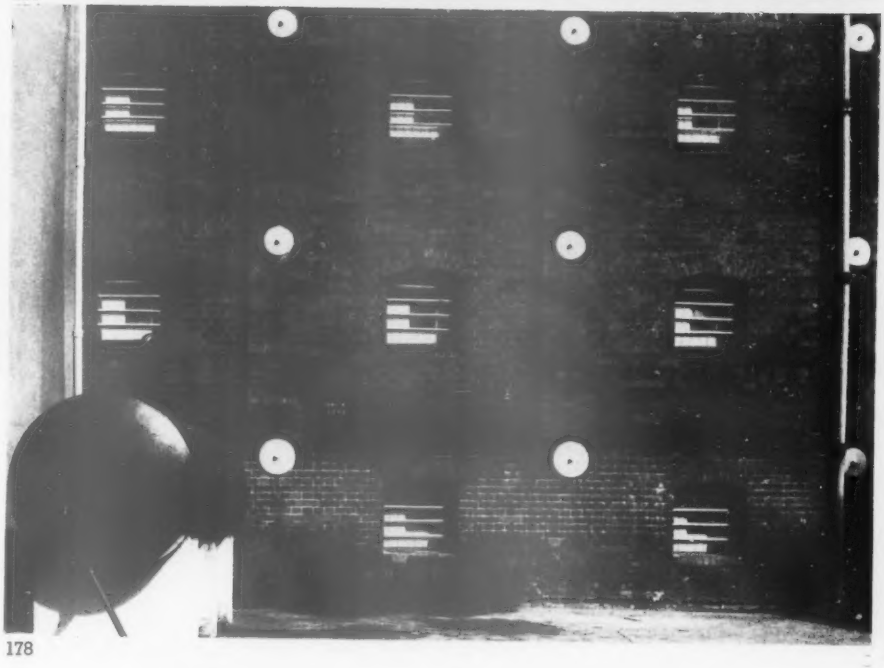
175, the spectacular scale of the free-standing malting (Gilstrap, Earp and Co., Walton, near Peterborough) is derived from its long, symmetrical façade, steep dormered roof and the rows of small windows crowded beneath it.

177

MALTINGS

176

The architectural ingredients common to all maltings: 176, the high pyramid-roofed kiln, slate-covered (R. C. W. Paul, Ipswich); 177, the grouping of kiln-vents against the sky (Langley, Wores.); 178, [illegible] pattern of small segmental louvred, and superimposed [illegible]-irons, in this case white [illegible] Co.).



178

MALTINGS

A typical flooring-block, with simply buttressed brickwork, square segmental windows with white painted wooden louvres and a regular pattern of tie-irons, in this case elaborately moulded: at Colchester, 1853. The surprising scale of these buildings is given by the small distance (sometimes less than six feet) between floors, and therefore between the rows of windows.

179

180

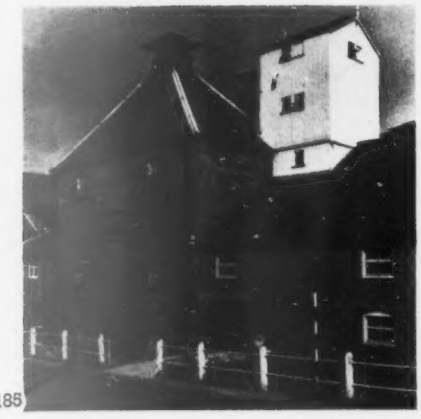
181

182

183

White painted weather-boarded structures, contrasting with the predominating brick-work, are features of most maltings: 181, St. Stephen's Maltings, Canterbury (Mackeson and Co.), a fairly late nineteenth-century example; 182, the rather earlier red brick Bishop's Stortford maltings; 183, by the River Lea at Stanstead Abbots, Herts. Here the tie-irons occur as a single white-painted row beneath the hipped gable.

184



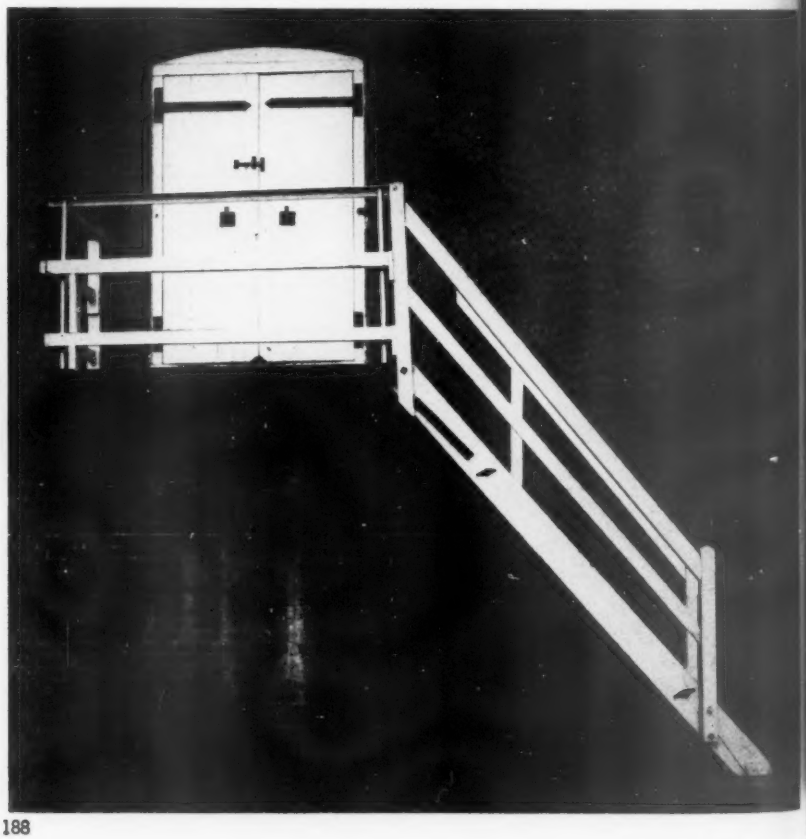
185

At Stroud Brewery, Glos. In 184, conical kiln-vents, faced with tiles, grow out of a slated roof; 185, has the usual mixture of brick, slate and white-painted timber—in the form of an obviously later, but wholly consistent, addition.

186

The maltings at Snape, Suffolk, in which dwellings are incorporated in the main range of buildings (on the left in 186, above), is not only one of the finest specimens of its kind, but shows how work of several different periods maintains a unity of character when it all follows the same functional principles. The long façade, 187, consists of buildings dated 1859, 1884 and 1885, and at the extreme end (just left of 187) is an addition of 1952, simple and completely harmonious. 188, a typical example of the robust wooden detailing. Here the circular tie-irons are painted black instead of white.

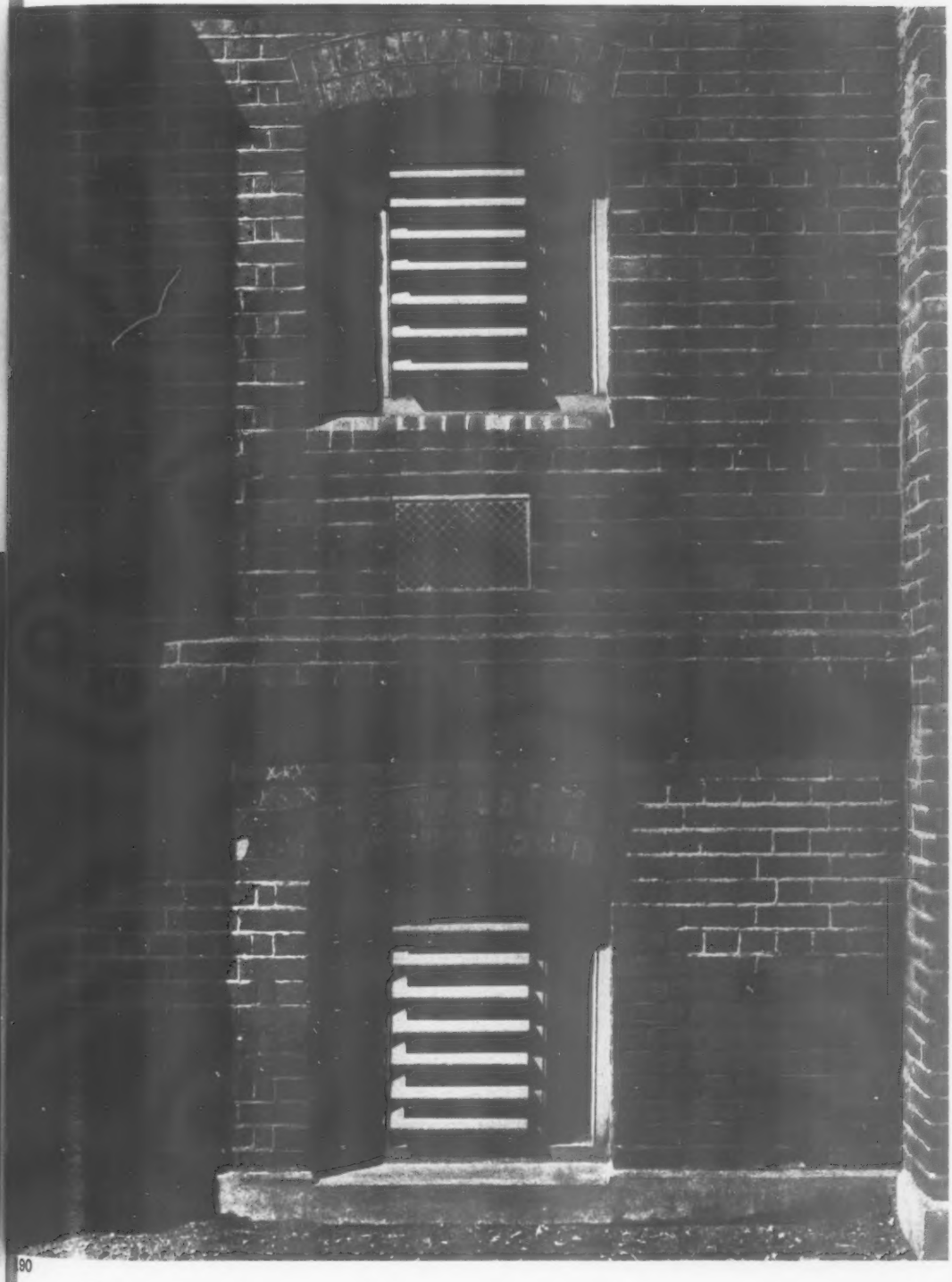
187



188

The huge eight-storey maltings at Mistley, Essex (Free, Rodwell and Co.) in yellow and red brick, notable for its strongly modelled details: 190 (below), close-up of windows—see also page 62. On the right, types of East Anglian maltings.

189



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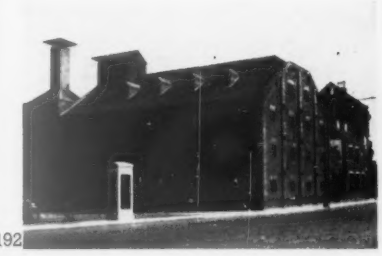
191

191, at Beccles, Suffolk (by the station); built 1860; owned by John Crisp and Son.



192

192, at Great Yarmouth, Norfolk (North Quay); owned by R. S. Watling and Son.

193

193, also at Beccles; here the usual slates on the roof are replaced by pantiles; S-shaped tie-irons.

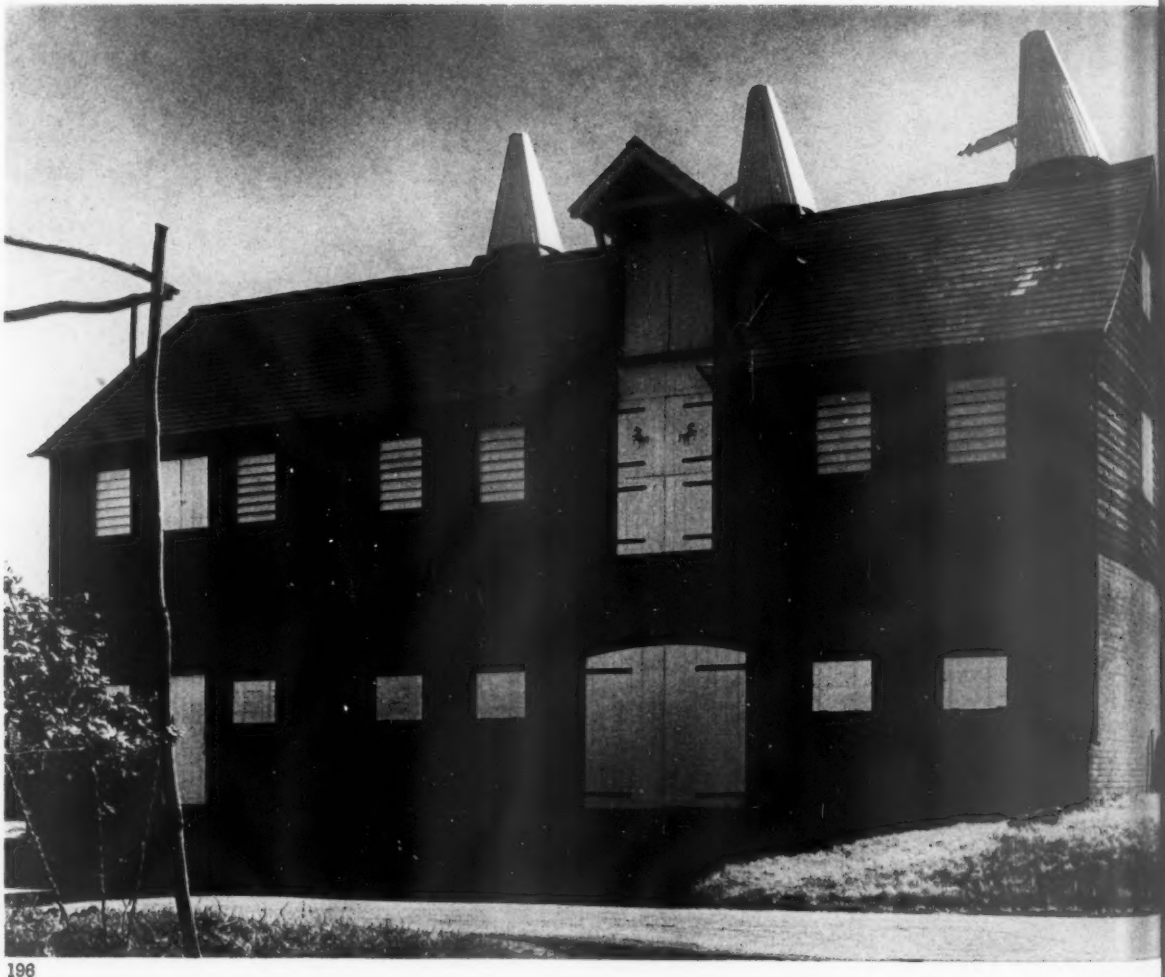
194

195

Maltings and dwelling-houses happily grouped, as often occurs in small towns: 194 (left), at Henley-on-Thames, where the white kiln-vents match the white walls of the house; 195, at Bishop's Stortford. Note the interesting spacing of the black tie-irons in the building on the right and the closed triangular dormers in the roof.

MALTINGS

OASTHOUSES

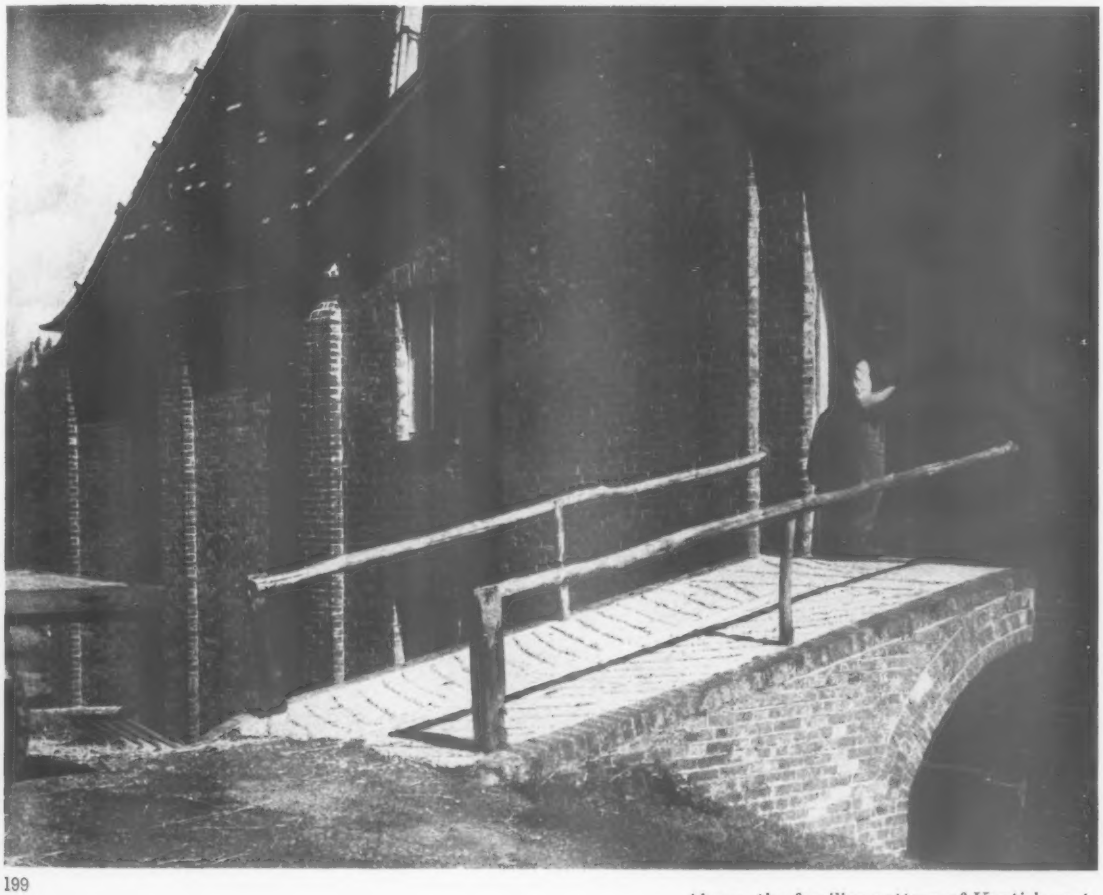


196

196, the combination of black-painted weather boarding, white-painted doors and window-shutters and a red brick base give richness of tone to this oast house at Boughton, Kent.

197

198



199

Above, the familiar pattern of Kentish oast house, with conical-roofed drying kilns, 197, crowned with delicately detailed wooden cowls. This example, at Cobham, has square kilns also, 198. 199, close-up of the entrance, showing subtly varied geometry in brick.

200

200, side view of the oast-house opposite, with its triple drying kilns.

THE FUNCTIONAL TRADITION, PAST AND PRESENT

This issue of the Review *deals with the functional tradition as shown in early industrial buildings, and it is pointed out in the introductory article (pages 5-7) how the same tradition runs through the history of English architecture, emerging strongly wherever the challenge of function is most simply, economically and unselfconsciously met. Herewith is a sequence of reminders of the way the timeless qualities characteristic of the functional tradition show themselves in buildings of all periods and styles.*

1, the medieval tithe-barn at Great Coxwell, Berks, where the great span of roof, the consequent buttressing and a pattern of ventilation apertures are relied on for the building's forceful architectural effect. 2, Twizel Bridge, Northumberland, with the widest span of any surviving medieval structure in England. Its strength is

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emphasized by the emphatically ribbed arch. Farm buildings illustrate the timelessness and the vigorous geometry of the functional tradition: 3, a stone-built farm near Belper, Derbyshire. 4, a later example of the same anonymous vernacular: Abing-

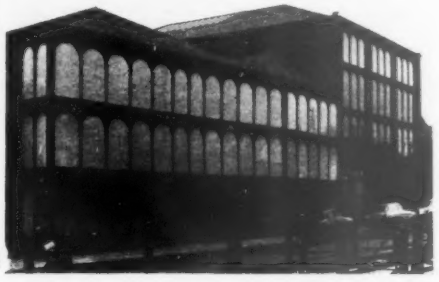
4

don gaol, 1801, now used as a granary.

Although the tradition is in its essence anonymous, its principles have been understood and applied on appropriate occasions by a number of famous architects, notably Soane. 5, the stables at the Royal Hospital,

5

Chelsea, 1814-17, a precedent which suggests that modern architects, in spite of living, as Soane did, in a self-conscious age, could learn from the products of this unselfconscious tradition. 6, new materials used lightly and delicately to make a typical



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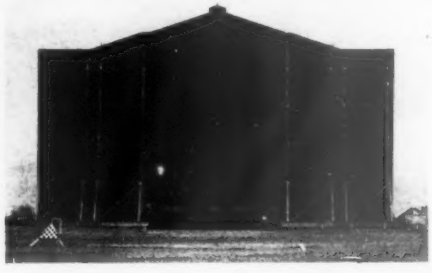
Victorian contribution to the tradition: a furniture store at Macclesfield, with cast-iron façade presumably of the 1870's. 7, the unsought-for impressiveness of the great steel envelope—an early example: the air-



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ship hangar at Cardington, Bedfordshire, built in 1917. 8 and 9, two of the twentieth century's anonymous contributions to the

[continued on page 75

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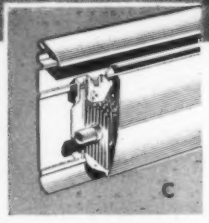

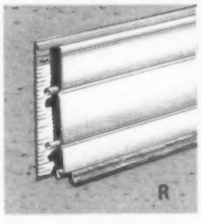

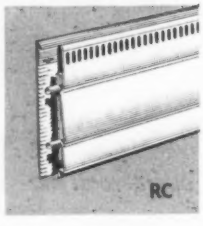

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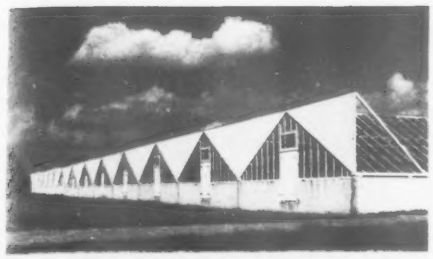

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continued from page 74]

tradition: glass-houses at Spalding, Lincs, and that now common object of the English countryside—splendid in shape if not always found where one would want to find it—the concrete cooling-tower of the modern power-station—this example is at Fleetwood. J.M.R.

MEMOIR

SIR PATRICK ABERCROMBIE

When Sir Patrick Abercrombie, seventy-seven years old, died at the end of March, Britain lost its first and probably its last great town and country planner. He was fortunate in his time, as the time was fortunate in him. The first forty years of deliberate planning, the years of opportunity for the new profession of planning consultant, coincided almost exactly with all but the last years of his working life. And since he had qualities that were far superior to those of his contemporaries, he dominated the planning field for the whole of that time.

He began as an architect. But he never much practised architecture in its more limited sense; and he had few actual buildings to his name. And although his early plans (especially the design which in 1913 won the international competition for the replanning of Dublin) were notably fresh, imaginative and humanistic, and although the professorial chair which he occupied for twenty years at Liverpool has the title of Civic Design rather than Town Planning attached to it, his major contribution was not to the architectural aspects of planning. It was as a *regional* planner, rather than a *town* planner, as a designer working on a wide territorial basis rather than a narrow one, that he made his greatest contribution and had his greatest success.

It has to be admitted that some of the later town plans with which his name is associated are below his best work. But because of his manner of working, it is difficult to estimate the full measure of Abercrombie's direction or participation in these. Throughout his working life he never had an 'office' of his own in the ordinary sense. He always worked in collaboration. Even in the early plans for Dublin and Stratford-on-Avon he was joined with others—in the case of Stratford with neither fellow-architect, fellow-planner nor local surveyor, but with a poet, his brother Lascelles. In almost every place or region that he planned, except Hull, where his collaborator was Lutyens, he worked in association with a local man. Of all his plans up to those of the 1940s, it is safe to say they are wholly his own, and that his collaborator was little more than a local survey-agent, his acknowledgment of the 'collaboration' on the title page on the published report (and how elegant as well as authoritative those reports were!) being more an expression of his characteristic generosity than anything else. But for the later *town* plans, those made during and after the war, one has the feeling that they were less than wholly his: they lacked something of his characteristically sensitive handling: and one feels that the collaboration there was of a much fuller kind, and that in it Abercrombie took over attitudes and ideas which at a freer time (for though he was in his mid-sixties he was immensely active during those years) he would not himself have naturally inclined to.

The regional plans were a different matter. There he was both pioneer and indisputable master. Beginning with the plan for the Doncaster coalfield (1920–22), the first plan of its kind in Britain, and probably anywhere else, he produced a series of something like a dozen others, culminating in the plans for the county and region of London. To the making of these plans he brought a remarkably extensive knowledge and understanding in the fields of sociology, topography, geology and economics, an imaginative

Sir Patrick Abercrombie presenting his master-plan for Addis Ababa to the Emperor Haile Selassie, in Addis Ababa last year.

sensibility, a fine deep humanism—and, in addition, his highly developed sense of large-scale design. It was this sense of overall design which in the end made all the difference between his plans and those later practioners in the same field. His regional plans were not, as is so often the case, a mere co-ordination of differing considerations and of small local plans. They were plans for imaginatively (though solidly practically) *designed* regions.

That was Abercrombie's most distinctive contribution to planning. That, and the related activities which went with it—his founding and direction of the movement for rural preservation: his labours on the Barlow Commission to secure, beyond the regional planning he had been so much engaged on, a still wider planning—national planning through the control of industrial location, through the development of new towns, through the establishment of national parks; and through the massive machinery of the Planning Act of 1947 (which resulted largely from his advocacy) to make all those things, as well as local planning, possible. It was a very great contribution and the honours and fame that it brought him were splendidly deserved.

But the planner's profession can be, and very often is, an unrewarding one in the end. Few activities can be more frustrating—in Britain at least. And Abercrombie had his share of that, though he bore it with remarkable resilience and vigour. He saw most of his plans ignored or mutilated. He saw the mountainous powers of the Planning Act produce, after years of labour, mousy little plans that were hardly plans at all. And he saw his chosen profession, his lifetime's vocation of planning consultant, dried up when planning passed into the hands of officials. After 1947, Abercrombie, along with other consultants, was denied almost all work in connection with planning in Britain. While junior assistants in planning offices (the upper officials being too busy with committees) were designing the redevelopment plans for the cathedral cities, the county towns, the market towns which are one of the glories of England (to say nothing of the industrial towns which are not), while the juniors who had only just finished their studies were doing this work which requires such subtlety of touch and such maturity of judgment, Abercrombie and his fellow-consultants were unemployed. He, with his international reputation, the biggest planning reputation in the world probably, was sometimes called on to plan abroad—Hong Kong, Cyprus, Addis Ababa. But never in England. It is true that he was old by then; but he was extremely vigorous and vital, and was eager to be working still.

If the Planning Ministry, the planning authorities and the planning officers gave him and his fellow-consultants no work, the Town Planning Institute gave him its Gold Medal (the R.I.B.A. and other bodies had done this earlier, but the T.P.I. medal was instituted only in 1953, and Abercrombie was the second recipient of it). But perhaps it had better not have done so. For, at the special ceremony which was called for the presentation, less than a dozen people saw fit to come and do honour to the greatest member of their profession.

It has been said that Abercrombie was the first and probably the last great British planner. He was the first because his great qualities met the great opportunities he was given. He was probably the last because officialdom has killed the independent planner by denying him all opportunity of work. If another Abercrombie is on the way somewhere (though they are rare spirits) he had better not be born in Britain. **Thomas Sharp**

EXHIBITIONS

The selections from two famous collections of modern paintings recently shown in London under the auspices of the Arts Council contained pictures of exceptional merit but, for opposite reasons, made unsatisfactory exhibitions. In spite of its impressive examples of Matisse, Picasso, Braque, Rouault and Chagall, the Musée d'Art Moderne show was too ambitious. The one hundred and sixty-four good, bad and indifferent works hung in the R.B.A. Galleries were jockeyed into an exasperatingly make-shift survey of the School of Paris, and the large and important-looking pictures by unimportant painters which revealed the unexportable side of the School of Paris were brought into unnatural prominence.

The Solomon R. Guggenheim Museum is not subject to the compromises and pressures which bedevil the acquisition policies of state-owned museums, but the seventy-four works, ranging from Seurat to Jackson Pollock and Riopelle, extracted from the collection for a European tour, made a somewhat whimsical miscellany, and the basis of selection remains a mystery. The Director, Mr. J. J. Sweeney, says that the Museum is not attempting to embrace as many aspects as possible of twentieth century art, but is assembling 'a choice body of paintings and sculpture which may be held up to the public as a gauge or standard of quality.' On the face of it, and if the selection shown at the Tate is in any way representative of the collection as a whole, those members of the public who take it as a gauge of quality are likely to acquire some curious biases. What conclusions will they draw, for instance, from the presence of three not very good paintings by Franz Marc and the total absence of Matisse? What are they to make of the fact that there are five large paintings by Robert Delaunay and only one small work by Mondriaan? And does Mr. Sweeney think that the picture by Stuart Davis, say, represents a higher standard of quality than an early Chirico or one of Max Ernst's 'forest' abstracts? Perhaps there would have been no need to ask such questions if Mr. Sweeney's introduction had been more informative. In any case, once one had accustomed oneself to the fact that some of the inclusions and omissions were on the eccentric side, it had to be admitted that almost every painter in the show was represented at his best.

The solitary example of Bonnard was a case in point. It is one of those interior-exterior compositions at which he excelled, and in which, without a trace of impasto, he gives a wonderful account of the density

1

of the real world, 1. His complacent delight in his surroundings as he found them is reflected in the superb indifference to 'priorities' which enabled him to give his entire picture surface an amiable and tempting sensuality.

Bonnard's 'Dining Room on the Garden' was painted in the 'thirties, but the foundations of such perceptual triumphs were laid before the conceptual approach of the cubists and surrealists put a primitivistic emphasis upon the obsessional presence, and now, when a painter like Masson attempts to hide from the phantoms he has raised by gaining a footing in that focusless world where Monet and Bonnard bear witness to the equality of a thousand small sensations, he only succeeds in giving us an account of the vertiginous sensation he experiences when he unfocuses his vision. But less sensitive men

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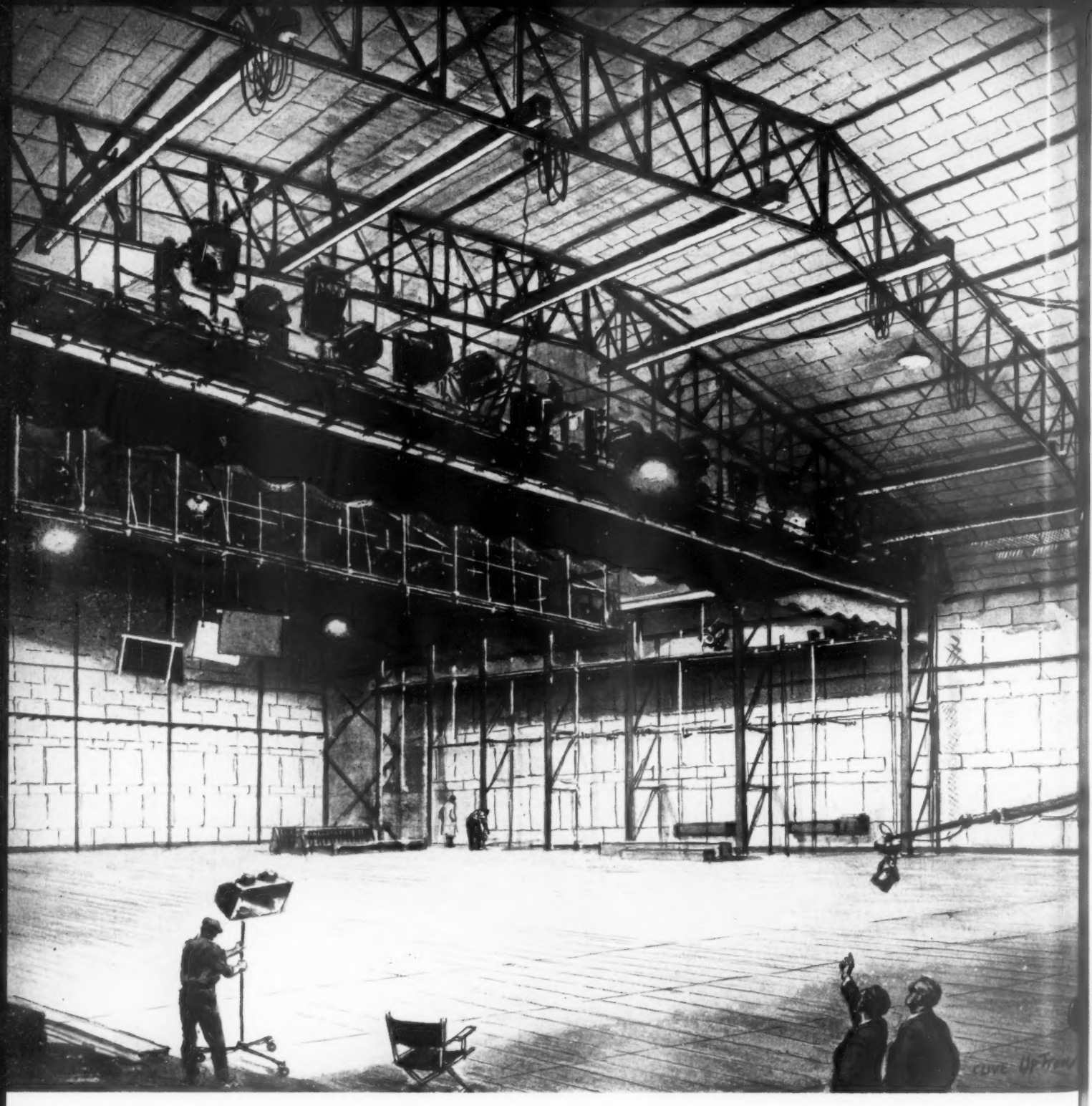

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an Masson, such as the painters connected with the Spazialismo movement who ve been exhibiting at Marlborough Fine rts, do not even transmit their giddiness, although they claim to be painting their maginary experience of outer space. I must nfess, however, that all those devotees of opular astronomy whose turbulent brushtrokes are supposed to be read as solar isturbances seem to me to be following one of the least rewarding byways of action ainting.

Reg Butler's third exhibition at the Hanover Gallery was devoted to bronzes of the female nude. The struggle between open construction and closed form that added drama to his previous exhibition has been succeeded by an equally dramatic struggle between his interest in primitive fertility symbols and nubile girls, 2. These

2

tense, brilliantly conceived and sometimes brutal-looking hybrids, absorbed by their own nakedness, create a sensual atmosphere which is very far from Bonnard's amiability. Their closeness to the human effigy suggests that Butler may be striving to obtain his release from the regiment of obsessional presences that picket the course he has followed, but if this is so, he is not finding it easy to elude them.

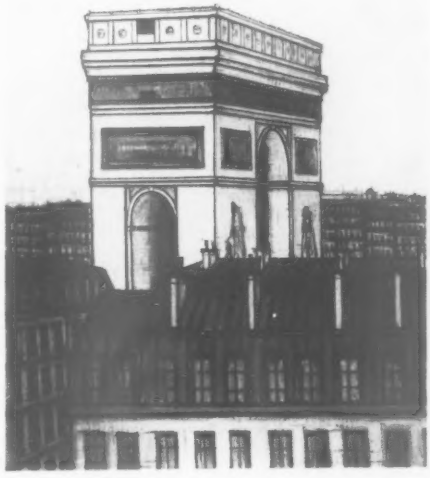
The Italian sculptor Mirko, less turbulent than Butler, has a way of being able to draw the sting of those emblems of primitive magic that prompt him to raise his pillars of cut metal. The large tubular form which dominated his first London exhibition, held at the Arthur Jeffress Gallery, was frankly entitled 'Totem,' but by the time he had completed his complex and elegant surgery it had shed its phallic connotations and every hint of barbarity, and turned into an image of rustling leaves imprinted with the last startled gaze of Diana, 3.

The obsessional presence turns up in

3

4

unexpected places. It regarded the visitor with an almost baleful watchfulness from Edward Burra's flowerpieces at the Lefevre Gallery, 4, and arose with the simple authority of a very Freudian dream from the *Arc de Triomphe de l'Etoile* 5, in



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Bernard Buffet's exhibition at Arthur Tooth & Sons. Buffet's studies of Paris gave one the shivers, for it was as if he had ordered every living soul off the streets before settling down to stare with cold eyes at her monuments.

It was very different at Whitechapel Art Gallery when the paintings and drawings by Bernardo Bellotto from the collection of the National Museum of Warsaw were on view. One could watch there the bustle in the streets of eighteenth-century Warsaw as if one were standing on the terraces and at the open windows from which Canaletto's nephew established the points of reference for his large, accurate and wonderfully detailed vistas of an animated and rapidly developing city. This view of the Church of St. Bridget, with the Arsenal just beyond it, 6, is on the outskirts, and one wouldn't want to stay there long for fear of missing the comings and goings of the gentry and soldiery and the animated interchanges of the common people nearer the heart of the city. I found myself returning again and again to

6

Dluga Street and the market place in the new town and Miodowa Street, to watch the crowds in the shadows cast by buildings which rose nobly and imperturbably into sunlight. Bellotto did not rival Guardi or Canaletto as a painter, but he was their equal in his continuous and loving respect for a great city and their superior in his consistent regard for accuracy.

Robert Melville

COUNTER-ATTACK

BUREAU BULLETIN

This bulletin is now a regular monthly miscellany feature operated by the Counter-Attack Bureau. Cases under investigation have a code number which for easier identification will be used in subsequent progress reports. Examples of good planning and of outrage averted will also be included regularly.

14. S.O.S. Bottisham, Cambridgeshire. The cottages around the church, 1, which are a

1

foil to the tower and an essential visual part of the village, are to be demolished as part of a 'slum clearance' scheme; Newmarket R.D.C. want to build old people's bungalows behind a new 'improvement line.' Reconditioning and improvement of the cottages is the obvious solution and would cost far less than building new houses. Any new building which has to be done should at least keep to the existing building line—anything else would totally destroy the unity of this little green.

15. Esher Common, Surrey (Central Electricity Authority). A 275 kv line is proposed running from West Weybridge to Chessington across Esher and Arbrook Commons. This is a clear case for putting the wires underground—these commons are the first open space south-west of London and their small scale informal scenery is the type most likely to be broken open by pylons—as has just been done in similar scenery near Bagshot in West Surrey. The rest of the route is arcadia which would really justify the estate agents' description of 'high class residences'; wayleaves are likely to be hard to get, and might well result in a public inquiry which would cost a good deal of the extra money needed to put the wires underground on this short length (about 7 miles).

16. Mortlake, Surrey. (Barnes Corporation). Mortlake High Street is just finishing a fearful metamorphosis. It started jolly and bustling, 2, and is finishing sterile and reactionary, 3: evidently modern architecture might as well not exist in Barnes-and-Mortlake. It has been done 'to enable

2

3

lorries to park comfortably there,' which in this case is reasonable, for there are factories jammed between High Street and river without any parking space at all. This could have been provided in lay-bys, not with a general and horrible improvement line; in particular the slice which has still to come off the churchyard is quite unnecessary; it is only being done to make the map look tidy. A tiny bit of Mortlake could thus be saved; the next thing that is needed is something to camouflage the flats!

17. St. John's Wood, London. (St. Marylebone Borough Council). The St. John's Wood Preservation Society have been fighting hard for over a year against concrete lampstandards in the side roads. The Council—which seems to regard St. John's Wood as an expensive luxury for a 'progressive' and 'go-ahead' borough—has agreed to halt the programme while the R.F.A.C. considers the scheme, but now proposes yellow sodium lighting on the main roads in St. John's Wood. Once there, uniformity will probably enforce it on side roads as well.

Here is the solution. Colour corrected mercury gets rid of the worst colour distortions; it costs 8 per cent more than sodium on the main roads, 6½ per cent *less* than sodium on side roads. The mileage of side roads in St. John's Wood is nearly four times that of the main roads, so that over the whole area colour corrected mercury would be cheaper: it should be fitted in the existing Victorian standards, and the concrete ones taken away again. At present they are standing side by side like Cinderella and the Ugly Sister, 4.

4

If the Society gets no satisfaction, this is a case for a public inquiry, for even though it is a local matter, it has a general application—and the fate of St. John's Wood is a national matter, not a local one.

18. Feckenham, Worcs. (Central Electricity Authority). A supergrid substation covering eighteen acres is proposed in one of the least spoilt parts of E. Worcestershire as part of a spur from one line in the supergrid which here loops around the west of the Black Country from Burton-on-Trent to Penn near Wolverhampton, and then to Astwood Bank near Redditch, diverting through Feckenham on the way. If the line ran direct from Penn to Astwood Bank it would go through more spoilt countryside nearer the Black Country, would be shorter—hence cheaper—and the substation could be put near Astwood Bank, which is itself a fairly grim late Victorian manufacturing village. Wherever it's put, it ought to be camouflaged, and it is the planning authorities' job to see that this happens. A public inquiry will probably be held, at which the Bureau will be represented.

19. Whitehall S.W.1. (Ministry of Housing and Local Government): The recent white paper on functions of County Councils and County district councils seems likely on the face of it to make a bad town planning system worse. It recommends automatic delegation of Town Planning powers to county district councils with a population greater than 60,000. Unless the Ministry insist on the policy of 'no delegation without qualification' (Counter Attack, page 432) this could mean an end of any hopes of coherent regional planning; at best this will add many more separate authorities to the hegemony from which a regional planner would have to coax some real planning. What is needed is a complete review of delegation, with big decisions kept firmly in the hands of the county (or region) where they can be seen as a whole, and smaller things delegated only if there is a visually qualified man to administer them.

Planner's Casebook: Edinburgh and Elgin, Morayshire. Shopfronts set back behind arcades are an invaluable town planning technique, at the same time increasing the effective road width by dispensing with a normal pavement and creating a pedestrian piazza.

5

It has been used in face-lifting Edinburgh's Royal Mile, and is now proposed by the *Moray Courant* as a solution to a traffic bottleneck in Elgin, where arcades formerly existed, 5 and 6. This is a copybook example of Improvement—a change which would make Elgin both look better and work better—and in producing the scheme the *Courant* have given a lead which many local papers could emulate.

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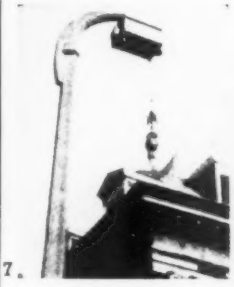
Outrage combated: Abingdon, Berks. The concrete standards around the Town Hall, shown in *Outrage*, 7, have been removed and replaced by steel standards and brackets, 8, which are not



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elegant, but—far more important—light and unobtrusive. The photographs convey the change exactly: before, you saw Post-Restoration dormers competing ineffectively with a Post-Planning swan-neck; now you see Abingdon Town Hall first and the lamp-standard second. We wish the Town Council could be credited with this improvement: in fact they merely carried out the change at the request of the Fine Art Commission.

WEST END PARKING

The parking meters are about to go up in Mayfair at the same time as post-Suez traffic has demonstrated that congestion is far more a matter of stop-and-start intersections on the main streets than anything else. The symbol of the metropolitan traffic jam is not the parked car in the side street but the traffic lights all the way down Regent Street. You could always get around *inside* Mayfair, parked cars or no; the trouble started when you tried to get out of it.

Even when the traffic is reduced, you still can't drive down Oxford Street easily; and for the Oxford Street shopper, playing a perpetual game of look-right-look-left, life is still hell. Parking meters won't help this, nor are they really likely to discourage parking, though they will cost the government a lot of money—from 8s. 6d. to 19s. 6d. in the pound, depending on the size of the profit of the firm who owns the car in question. If they are intended as an attempt to stop private motoring in cities *per se*, fair enough—but let's not deceive ourselves with talk of good intentions about 'speeding London's traffic flow.'

It might be worth while to take a look at other solutions. In fact, one of them has been lying around in plain view on the South Bank for six years. When the new Waterloo Bridge approaches were built at the time of the Festival, the north end of Waterloo Bridge Road became one side of a triangular island and the street in the middle of the triangle was blocked by carrying the pavement across one end. What happens? The blocked street becomes a safe and inoffensive car park in which vans can still deliver and turn round easily (and at the same time it becomes a more pleasant street to live in—from the road safety point of view it is almost a play street); the pedestrians going to the South Bank have one less road to cross, and through traffic circulates easily round the island thus created.

This might be a possible solution for the West End, and for any town where there is still room

[continued on page 79

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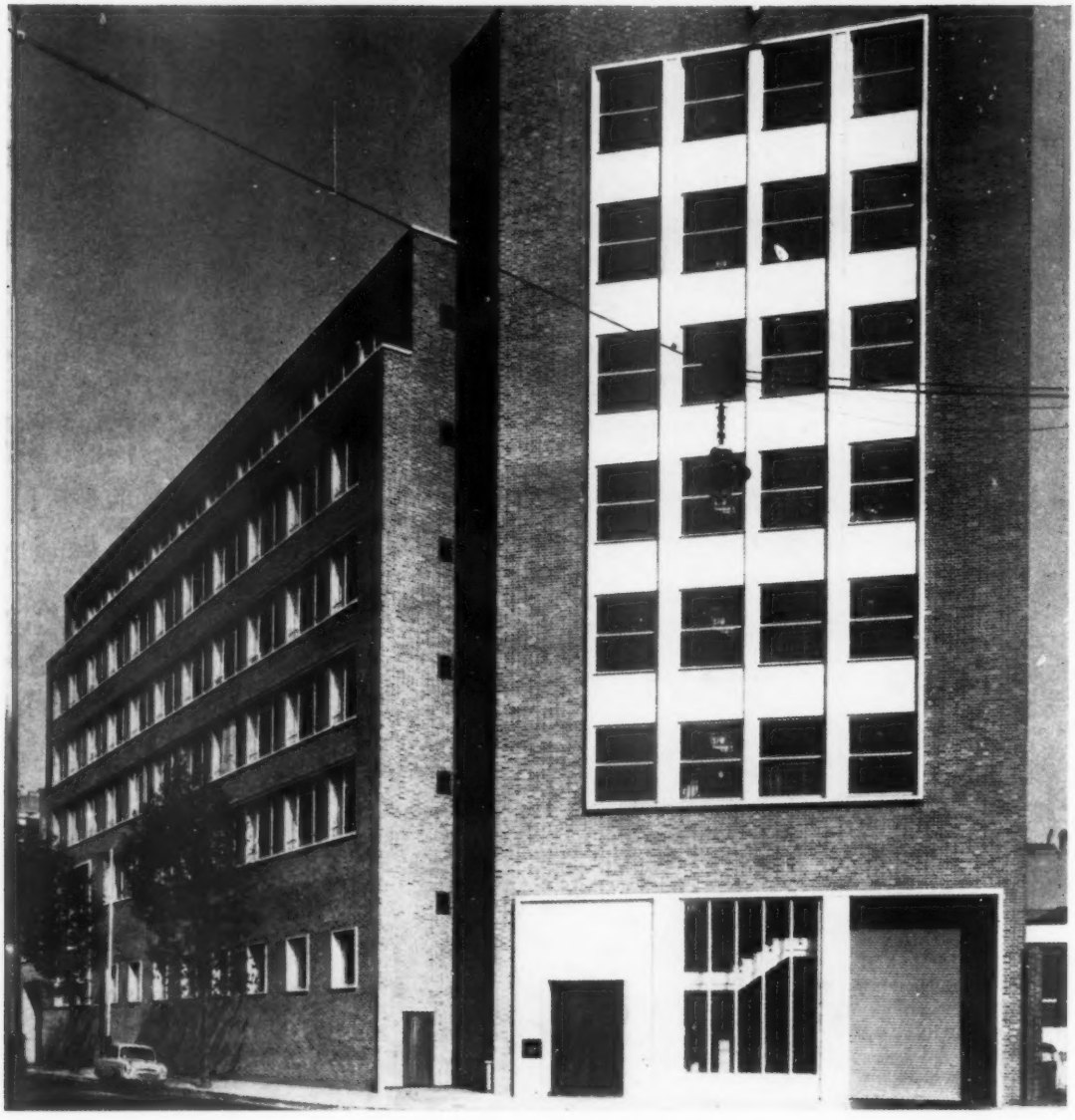

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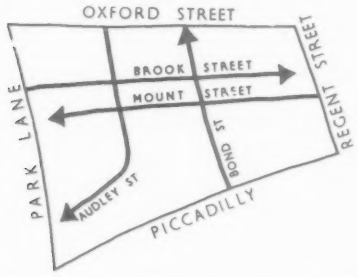
ontinued from page 78]

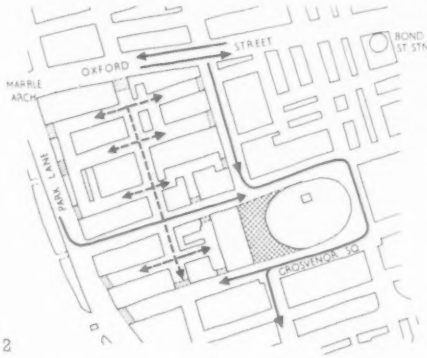
o deliver and turn round in the blocked streets, nd *where* the main traffic roads are big enough to ake a huge flow of traffic as long as it is moving eadily.* The solution is to treat all Mayfair nd all Soho as vast islands, hinging on the paradox hat the more side roads you block up, hence emoving traffic lights, the easier is the traffic low along the main streets and the easier the job f the pedestrian struggling along the pavement. pplied to Mayfair the scheme—providing the inimum number of one-way streets penetrating he area—would look rather like this, 1:



1

giving two intersections on each side of the quadrilateral: eight sets of controlled intersections instead of the present twenty-one. The whole system is in the same sense—anti-clockwise—so that traffic from inside would either infiltrate or cross straight over at the intersections without jamming itself (as it does, e.g., if someone wants to turn right at the top of Bond Street across the traffic). Similarly, you would only get into Mayfair by infiltrating. All the other streets would be reached from inside Mayfair by a system which itself would incorporate more blocked streets and through pavements.

Admittedly the result would be a maze—but what else is Mayfair now? Nobody goes there—and nobody drives in London as a whole—unless they know their way around and know what their vehicles can do. Judged by the statistic of accidents per vehicle-mile, London must be one of the safest places in the world. On the other hand, the suggested advantages are: easy passage along the roads that matter, free parking which hurts nobody, near-precincts inside the area, and nearly continuous pavements along the main shopping streets round the perimeter.



2

The results of sealing off a whole area of London like this must inevitably be no more than guesswork. But on a small scale it would certainly work and could be tested easily and cheaply. One night's work could put up temporary wood pavements over the ends of the blocked streets; the one-way system could be tested by using ONNO and thus provide a try-out for two schemes at the same time. The easiest place to start is the N.W. tip of Mayfair behind Marble Arch, which is already self-contained with little through traffic, and the scheme for this is given above, 20. An incidental bonus—just one of many that would follow from adopting this principle—is that Saarinen's new U.S. Embassy could have a piazza joining it to the gardens in Grosvenor Square.

Ian Nairn

*The City of London is an example of the other type: the main roads are narrow and the minor roads are microscopic: any form of street parking will cause congestion. Realising this, it has rejected parking meters and proposes multi-storey car parks. This in townscape terms is very convenient, for areas like the City are usually on a mediaeval plan and have their own pedestrian network of alleys; areas like the West End are usually 18th. or 19th century, more or less gridiron, and badly need their own pedestrian network, formed in this case by continuous pavements over the ends of the blocked streets.

S.O.S.

A CALCUTTA CEMETERY

Among the forgotten monuments of British Architecture in the East India Company's Presidencies (described in AR, February, 1957) one at least is now being carefully restored, although an appeal has had to be launched for more funds,* in order to ensure adequate completion of the work. It is one of the small Christian cemeteries, associated with the early settlements, and valuable for the great stylistic range of the tomb architecture it contains—South Park Street Cemetery in Calcutta, where, beneath spacious avenues, classical cupolas, obelisks and pyramids, 1–9, lie the men and women who built that noble and once beautiful city out of a simple trading establishment, surrounded by jungle.

The cemetery originally stood some distance beyond the limits of the European settlement—so far, in fact, that the Council found it necessary to grant the Chaplain a special allowance for the hire of palanquin bearers—and was opened just ten years after the battle of Plassey to receive the remains of a young writer in the service of the Honourable East India Company. It remained in use during the days of Warren Hastings (many of whose colleagues were buried here), and of the Napoleonic Wars. The love of classicism which dominated Europe at that time was carried in the hearts of the young adventurers to a strange and alien land, and is reflected perfectly in the

* See Intelligence, page 2.

1

2

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5

Obelisk, Dome, Column and Arch were the repertoire of architectonic forms deployed and re-deployed in the mausolea of the South Park Cemetery, Calcutta: the tombs seen in this column of views range from the seventeen-seventies (Lucia Palk, arch and columns, in 5) to the late eighteen-forties (Captain Hollings, dome and columns, in 2) and reveal a continuously vigorous classical tradition in Calcutta Presidency.

6

7

8

9

a Calcutta cemetery

The present ruinous condition of many of the monuments in the South Park Cemetery, Calcutta, is most lamentable in the case of those with delicate detailing, such as the Adamitic swags in 6. Robuster modelling, and simpler forms, 7 and 8, survive monsoons and neglect more successfully, but the gleaming purity of Sir William Jones's obelisk, 9, seen against the chipped outlines and maculate surfaces of adjoining tombs, shows how much even the simplest will benefit when duly restored.

mausolea which they erected to each other's memory. Graceful Roman cupolas and elegant Grecian urns were chosen to glorify the memory of those like Colonel Charles Russell Deare, who was slain by a cannon-ball at the storming of Tippoo Sultan's stronghold at Santinungulam, and of Sir John Clavering, the Commander-in-Chief, who for one day set himself up behind his guns in Calcutta's Fort William and declared himself Governor-General in Warren Hasting's place; and the solidity and confident serenity which is a key-note of their style contrasts markedly with the hectic and dangerous times in which the monuments were raised.

Since the alluvial mud of the Bengal delta is entirely stoneless, the monuments are universally constructed of brick and plaster. Stone for the inscriptions was at first shipped from Madras at very considerable expense, until a certain Samuel Oldham, the first professional undertaker in Bengal, revolutionized the procedure, and cut his costs by shipping marble down the river Hooghly from the ruins of the ancient capital of Gaur, in northern Bengal.

Architectural styles were copied from books of drawings in the library of the Company's College at Fort William, and builders avoided repetition as far as possible by attempting to combine styles and orders—frequently with no little ingenuity. But perhaps the most noteworthy feature of the cemetery is the use of the pyramid, which appears to have achieved almost universal popularity between the years 1790 and 1810, and then disappears completely. These plastered giants were apparently inspired by the study of Egyptology, then in its infancy, but it is remarkable that the forms should have taken root in Bengal, for two brief decades, and yet have remained virtually absent from Europe. Generally speaking, the architectural styles of the European settlements in the East have always been adaptations of contemporary Western fashions, yet the pyramidal form could scarcely have come direct from Egypt, and although by its very size it undoubtedly satisfied the craving for display engendered by a short life spent amongst riches, the question of its origin in Bengal remains unanswered.

Unfortunately the ravages of nearly two centuries of monsoon rain, and damp sultry heat, have begun to tell on the plasterwork of these graceful monuments; it is to be hoped that the restoration fund now set up will not only lead to the restoration of those which still remain, but will also provide for grassing the sites of those monuments which have already crumbled beyond repair.

R. Pearson

THE INDUSTRY

D.P.C. Insertion

The cost and difficulty of inserting a damp-proof course in an existing masonry wall is so great that it is customary for architects to dissuade clients from undertaking it on all but the most expensive improvement jobs.

It is interesting, therefore, to note two new machines which have been devised by Brooks of Oldham to cut horizontal slits in masonry walls for the easy insertion of a d.p.c. Since these machines have to run on a level, the insertion can only be made above ground floor level, and the 'travel' of the machines is such that it must be between 1¼ in. and 5¾ in. up from the floor. The two machines (which are both required: the one for straight runs and the other for corners) cost about £500; and in view of the fact that they are reckoned to cut the cost of this class of work by two-thirds, this seems a reasonable investment for the medium sized builder and one which architects should encourage him to make, so that in time these may become as common as, say, floor sanding machines. Another advantage is the expedition which this method shows: the makers claim that with the help of these machines two men can insert 60–80 ft. of coursing in one day.

One specialist firm who undertake damp-coursing work, using these machines (Damp Coursing Ltd., of 83 Lambs Conduit Street, W.C.1) inform us that the average cost of damp-proofing is 7s.-8s. for a 9 in. wall, 11s. for a 13½ in. wall.

Brooks D.P.C. Machine Co., Granville Mill, Vulcan Street, Oldham, Lancs.

Built-in Patterning

The idea that patterning is something which is essentially too personal to be the subject of mass production is an idea which dies hard with the architect. He will accept the notion that texture should be mass produced because texture, after all, is no more than a means of giving a form its true value: but once a texture becomes a pattern there is an implication that it requires attention in its own right and in doing so threatens to come into collision both with traditional artistic ethics and modern architectural theory. The publication by Bakelite Ltd. of a new series of Warerite melamine sheets which are described as 'architectural patterns' represents a serious attempt to get over this dilemma. The patterns (there are seven in all, five of them being obtainable in seven colours) are most of them excellent. They are doubtless called 'architectural' because their patterning has a strong geometric basis with small scale repetition so that they are calculated to bring forms evenly to the eyes' attention and thence may be considered more texture than pattern.

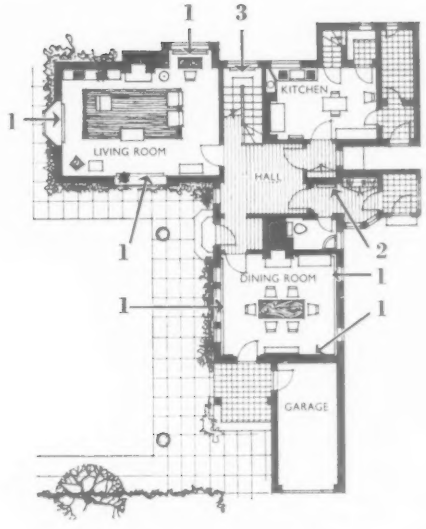
It is difficult to foretell how they will fare in practice. One factor which

[continued on page 82

This 3-bedroomed house near Tunbridge Wells was built in the 1930's. It has a fine view across the Weald of Kent. The up-to-date heating system is oil-fired, with fuel supplied by Shell-Mex and B.P. Ltd.

A HOUSE WITH MODERN HEATING

and a lovely view



1. *Skirting heating*
2. *Concealed radiator in hall*
3. *Boiler room with outside access below stairs.*

A DELIGHTFUL FEATURE of this attractive house is its beautiful situation. Built in the early 1930's, it is over four hundred feet above sea level and has an open view of over seven miles to the North across the Weald of Kent.

In 1954 the house was purchased by its present owner who, before moving in, added to its comfort and amenity by installing central heating. Lounge, dining room and landing were fitted with Crane skirting heating, while five radiators were installed in other rooms. An oil-fired boiler, situated in a small separate room below the stairs, supplies the hot water requirements as well as the central heating system.

Oil-fired heating is supremely clean, efficient and labour-saving; and oil fuel bought in bulk is surprisingly economical. It is suitable for blocks of flats and public buildings and, increasingly, it is being installed in houses of every type and size.

From hot water supply in the smaller home to full central heating in larger buildings there are now available special oil-fired units designed for every requirement. Two kinds of oil are supplied for heating – Shell Domestic Fuel Oil for the larger installations and BP Domesticol, the new fuel specially developed for the smaller boilers with vaporising burners.

If you are designing or modifying almost any kind of building, public or private, you may well find it worth your while to make provision for this modern, convenient heating method. For further information write to Shell-Mex and B.P. Ltd., Fuel Oil Dept. FD1J, Shell-Mex House, Strand, W.C.2. This, naturally, will not place you under any obligation.

continued from page 80]

'Apia,' one of the 'architectural patterns' in the new Warerite range.

is bound to affect their use is their cost: 5s. per sq. ft. for those printed in one colour and black, 8s. per sq. ft. for the one ('Exotica') which is multi-coloured. This means that their use will be restricted to positions (such as the walls of coffee bars and bar counters) where their redoubtable wearing qualities come into play or to places where, by common convention, 'expense is no object.' This means that there will be a tug-of-war between the aura which their social use will give them (and which may discourage some architects) and their intrinsic quality as good printed patterning on an excellent surface. Whatever be the outcome, there is no doubt that they are in the right line of experiment.

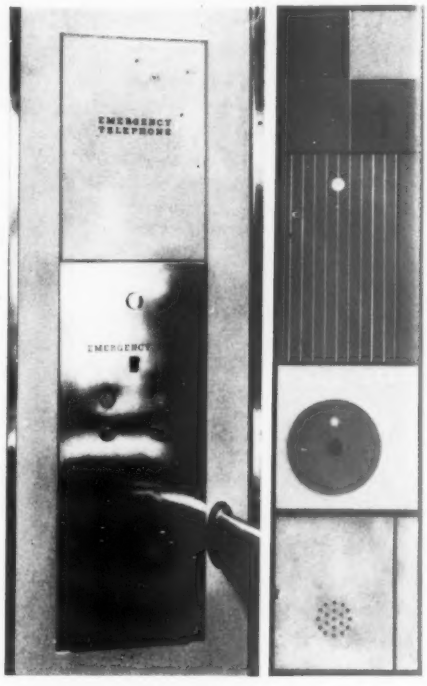
Bakelite Ltd., 12–18 *Grosvenor Gardens, London, S.W.*1.

A New Lift Book

When an article on lifts was written for the AR (February, 1955) it was very clear that the existing literature on lifts for architects in this country was exceedingly defective. There were, of course, the Codes of Practice (CP.407.101:1951 for electric and CP.407.301:1950 for hand-powered lifts), there was one useful trade publication (two, if we count that of a Swedish firm published in English) and there was, of course, a voluminous and, to the architect, inaccessible literature prepared for electrical engineers. It is therefore with pleasure that we note another excellent trade publication on lifts, this time by Hammond and Champness Ltd. Entitled *The Hammond and Champness Lift Book*, it is priced at three guineas, but we understand that it will be sent free to architects' firms.

The book is divided into four parts. The first is entitled 'Planning Lift Installations' and in fact runs through all the mental operations the architect must make, asking the questions which he must ask and supplying the data and tables which will enable him to work out the answers. Information is also given on more specialized applications, such as lifts to council flats, the special lifts the LCC requires in office blocks for firemen, hospital lifts and basement hoists. This section concludes with a very useful note on 'builders' work' specifying categorically what the builder must provide and fit and in what sequence.

Section 2 describes intelligibly the different elements of lift equipment and the alternatives for each. Architects will not need to avail



Left, car control panel and, right, landing panel designed by Maxwell Fry and Jane Drew.

[continued on page 84

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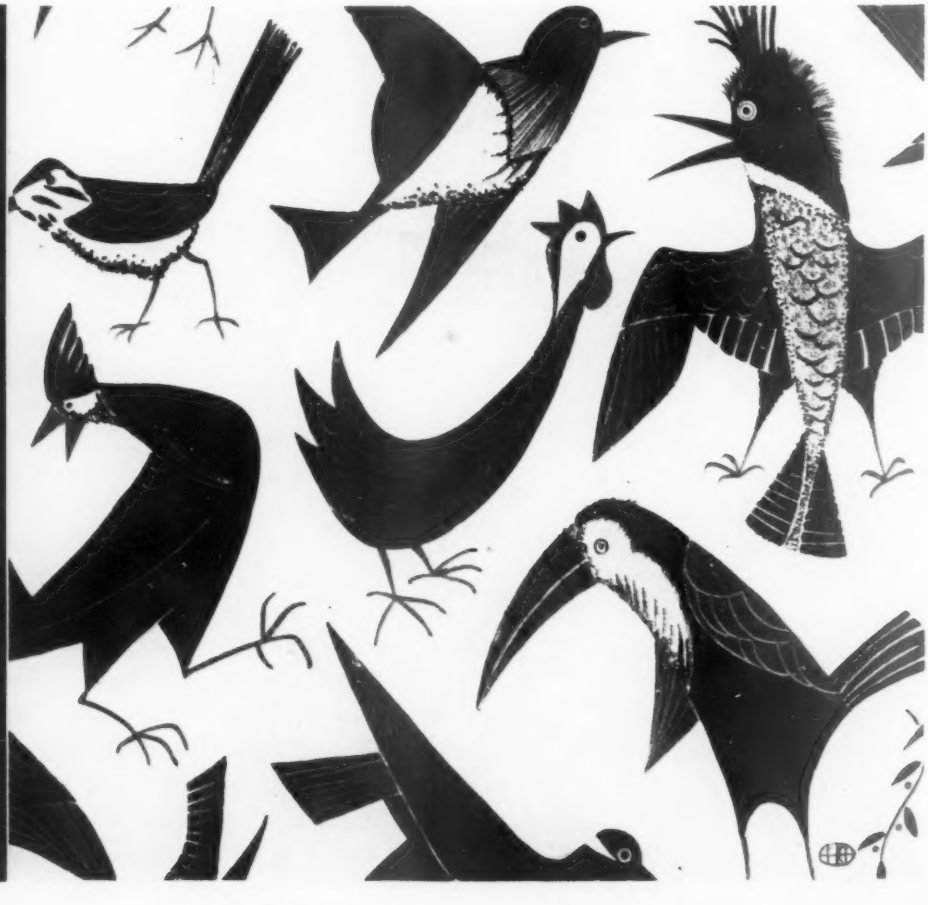

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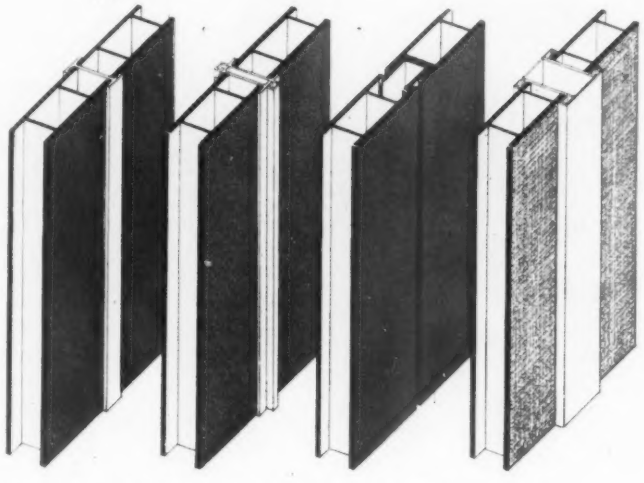
continued from page 82]

themselves of the 'suggested decorative treatment' for lift cars, but may contemplate instead some admirable push panels by Maxwell Fry and Jane Drew (see photograph). The third section is concerned with that almost extinct variety, the home service lift, and the fourth and last presents an anthology of extracts from the official Regulations and Recommendations. In all, this is a very useful addition to the office library.

Hammond and Champness Ltd., Gnome House, Blackhorse Lane, Walthamstow, E.17.

Holoplast Movable Walls

The new Holoplast catalogue entitled *Holoplast Movable Walls*, though it clearly pretends to be helpful, is, in fact, more of a prestige publication than a useful office reference. Its object is to make clear the methods and use of the different systems of jointing which Holoplast Ltd. have evolved for movable partitions. These appear to be four in number: the 'standard' for use where little rearrangement is envisaged, the 'assembly' for use where wall positions have often to be changed, the 'interchangeable' for use where it may be desired to insert different panels (i.e. to insert a door in a new position), and the 'universal' system for use where you are likely to want to do both these last two operations at the same time. To these we must add a fifth system, which is only for jointing panels in the same plane, entitled the 'tongue and groove' which, as its name suggests, enables them to be jointed without an intervening post. Our chief grumble about this catalogue concerns the full size details which, despite their generous scale, tell you nothing about how the parts are fixed together, in what sequence, or, indeed, what they are. This is very unfortunate because Holoplast must by now have an unrivalled experience of lightweight fixing and because for the architect this is the critical factor which differentiates the few good systems of partitioning from the others. The catalogue concludes with a section on sound insulation. This is inevitably the Achilles heel of lightweight partition, not only because the best sound reduction that Holoplast (or any other comparable panel makers) can promise is some 7 decibels worse than the 4½ in. brickwork plastered both sides, but also because the difficulty of jointing makes even this degree of sound reduction difficult to realize. As is pointed out, however, all that is required in most cases is that the sounds in the next room should be reduced below the noise level in this one; and as in offices this is likely to be of the order of 40 decibels the situation is not so impossible as it might seem—or perhaps we should say, sound. This is fortunate, for there is no doubt about the inherent rightness of the lightweight panel in the context of our architecture, or about the contribution which Holoplast have made—and will continue to make—towards the solution of its problems.



Isometric drawing showing four systems of jointing Holoplast panels.

Holoplast Ltd., 116 Victoria Street, London, S.W.1.

Asbestos Cement Pocket Compendium

Those of us who have been discouraged from using asbestos cement by the voluminousness of asbestos cement trade literature will find relief and encouragement in Universal's new 'pocket compendium.' This runs through the full range of products: sheeting, slates, sandwich constructions, ventilators, rainwater goods, cisterns, flue pipes and the rest, with a small clear photograph, a drawing and sizes of each. Such a bird's eye view reminds us at once and the same time of the extraordinary technical advances which have been made in manufacture during recent years and the extraordinary lack of imagination which has accompanied it. The fact of the matter seems to be that the asbestos people have only been prepared to make products for which a market already existed; which has meant in practice manufacturing in asbestos cement products which have hitherto been 'developed' in galvanized iron (e.g. cisterns and sheeting), in cast iron (e.g. rainwater goods and soil pipes), even in ceramics (flue pipes) and slate. It is, of course, a tribute to the extraordinary qualities of asbestos cement that it can be used to make so many divergent products; yet we cannot help feeling that an even more brilliant future awaits those who can imagine products which serve our practical and visual needs and which, exploiting to the

[continued on page 86

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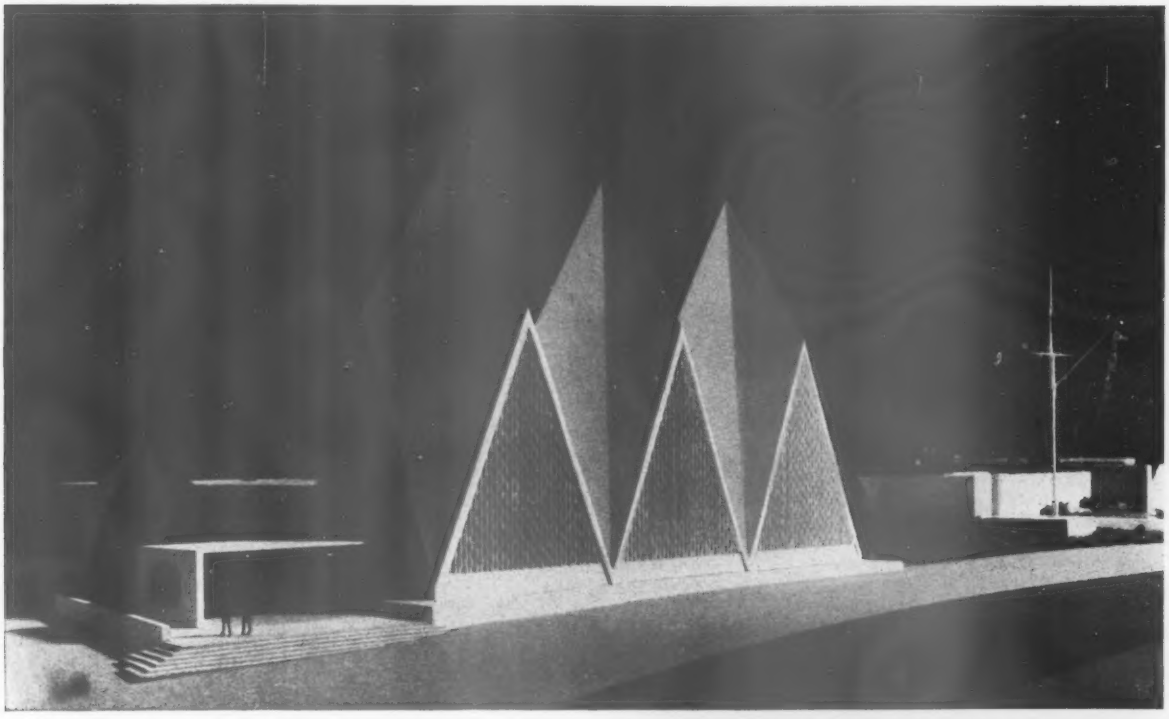

All U.K. buildings at Brussels Exhibition

At the 1958 World Exhibition at Brussels the British Government Pavilion and the British Industries Pavilion will occupy approximately five acres.

The Architects for the Government Pavilion are Messrs. Howard V. Lobb & Partners, who are also the co-ordinating Architects for the whole of the U.K. site.
The Architects for the British Industries Pavilion are Messrs. Edward D. Mills & Partners, and the Consulting Engineer for both Pavilions is Mr. Felix J. Samuely, B.Sc., M.I.C.E.

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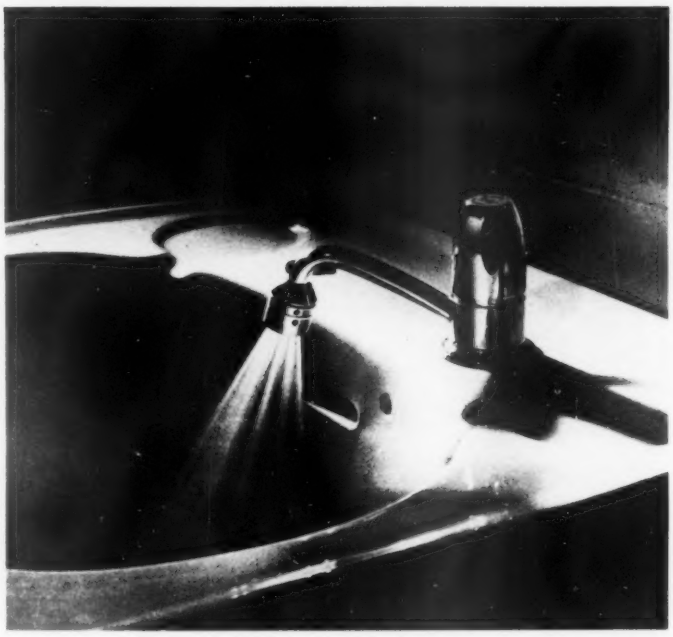
full the properties of the material, disregard the forms which other materials have found convenient.

Universal Asbestos Manufacturing Co. Ltd., Watford, Herts.

The Spray Tap

With the spread of the habit of excessive washing we have become far more prodigal in our use of water than we can afford to be. Impressive as our reservoirs appear, they in fact carry a wholly insufficient margin of water, so that whenever we have a fortnight's drought we have to be told to stop watering our gardens. The remedy is either to increase the size of our reservoirs—which would be exceedingly expensive—or to find a less wasteful method of washing. There has never been any serious doubt that our present-day habit of filling fairly large containers of water into which we put the parts of us we want to wash is inherently extravagant in water, and this has now been very neatly proved by Crisp and Sobolev of BRS, who carried out a series of tests in an MOW office building in which the use of ordinary taps in washbasins was compared with a special kind of spray tap. This experiment showed two interesting facts. The first (which is merely of sociological interest) is that whatever kind of tap you use, women use rather more than twice the amount of water *per capita* than men. The second is that by substituting spray taps for ordinary bib cocks it was possible to cut the consumption of hot water by considerably more than a half and of cold water by exactly a third. The actual weekly consumptions were as shown in the table, right.



Walker Crosweller's 'Unatap.' Below, table of comparative water consumption rate, with spray taps and ordinary bib cocks.

type of supply	weekly consumption in gallons		
	hot	*cold*	*total*
fully normal suites	16,000	6,000	22,000
spray suites (each with one normal basin) ..	7,000	4,000	11,000
saving in water	9,000	2,000	11,000

Furthermore, a ballot established that the majority preferred to wash their hands in a spray than in a pool. Following this success, the firm who developed the spray tap with BRS—Walker, Crosweller & Co. Ltd.—have now marketed their product under the trade name of 'Unatap.' This is, of course, a mixing spray tap which provides water at a standard flow (4 to 5 pints per minute) but at a variable temperature. At the first turn of the handle it sprays cold, and the temperature of the water rises as the handle is turned further. It is interesting to notice that in the tests the preferred temperature for handwashing was 105°F. In addition to saving water, the use of the tap saves the hot water load and saves also in the first cost of the basin: since basins which do not have to retain water do not need a plug, a chain, or an overflow. The tap has been accepted for use by the British Waterworks Association provided it is connected to supplies of equal pressure from storage tanks and not to the rising main. The price is £6 15s.

Walker, Crosweller & Co. Ltd., Cheltenham, Glos.

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